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STATE OF THE ART:  
MUSEUM ADDITIONS AND THEIR IMPACT ON OCCUPANT EXPERIENCE

BY  
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DISSERTATION

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## ABSTRACT

This dissertation takes a critical look at the effects of art museum additions on occupants by addressing key questions: How does museum addition design affect visitors' and museum employees' perceptions and experiences of "front stage" areas such as art galleries compared to employees perceptions and experiences of "back stage" areas such as their work spaces? How does it affect the newly transformed museum building's overall identity, image, spatial layout, and aesthetics?

Vast sums of money spent to design, construct, operate and maintain museum additions demand great accountability of museum leaders and design professionals towards museum visitors and employees. In an age where "starchitects" design buildings from squiggles drawn on cocktail napkins, an urgent need for evidence-based design exists. Evidence from in-depth studies of human factors in relation to design are necessary to respond to visitors' needs and the experience of viewing art. The museum narrative is framed not only by art objects but also by the space that contains them and how occupants experience this space. More post-occupancy evaluations of high-profile museum additions will help museum leaders and architects understand their successes, shortcomings, and how their designs affect both the visitors and the employees who use them every day.

This study focuses on post-1970 building additions of four premier art museum institutions of the US: the Nelson-Atkins Museum of Art in Kansas City, MO, the Phoenix Art Museum in Phoenix, AZ, the Metropolitan Museum of Art in New York City, NY, and the Art Institute of Chicago in Chicago, IL. It employs a cross-section of methods consisting of assigning space syntactic typologies to museum spaces combined with on-site physical

observations in all the four museums mentioned above, a qualitative content analysis of critics' reviews on additions to all four museums in the popular press—before and after they were built, physical measurements of illuminance of back spaces of the Nelson-Atkins Museum of Art and the Phoenix Art Museum and front spaces of all four museums, and collecting museum employee feedback via an online survey and on-site interviews at the Nelson-Atkins Museum of Art and the Phoenix Art Museum.

Most employees had positive overall opinions of the museum addition and also perceived their fellow employees' opinions and visitors' opinions as being positive, but they identified the need to make a number of improvements for accessibility and wayfinding in the museum. Observations confirmed these responses; the front stage spaces of museums for visitors were beset with problems of accessibility and wayfinding in both the new and old parts of the buildings—factors which also affected visitation levels in art galleries. Besides blockbuster shows and special exhibitions, the locations of art galleries (syntactic typologies) in the Met and the Art Institute were found to have an influence on their visitation levels. The lack of adequate amenities such as restrooms, water fountains, and seating, were also found to contribute to museum fatigue in visitors and employees. Museum fatigue had also increased in proportion with building size due to new additions; this was clearly a growing concern among museum employees.

The majority of light levels in art galleries were at optimum settings for art conservation. Many of them, however, did not meet accessibility requirements for ambient lighting, reading text panels, directional signage, and looking at specimens or objects, creating safety concerns and denying equal opportunities to individuals with disabilities. Art gallery

lighting also added to the numerous accessibility concerns related to gallery walks, ramps, and wayfinding in all case studies. *It was clear that occupants did not share equal status with the art in the museum.*

Employee feedback and observations of their work spaces provided insights into the inner workings of art institutions. Results showed that in the process of creating additions, decision-makers mostly ignored the human aspect. New additions with daylighting and other major upgrades in visitor spaces at the Nelson-Atkins Museum and the Phoenix Art Museum did not improve working conditions for employees in back spaces. They worked in spaces that were mostly windowless, without daylight and views, and very often located in basements—in the new museum wings as well as in the older buildings.

This dissertation gives an insider's perspective on the state of the occupants and how and why various decisions were made in museum addition designs. *It moves the spotlight away from the usual debates on architectural forms and blockbuster exhibitions, and focuses it on museum occupants instead.* By touching on key issues affecting perceptions and experiences of museum employees and visitors, this study bridges the gap between occupants and architectural design while illuminating the myriad ways in which museum additions have been conceived to date. The findings inform stakeholders in museums about the short-term and long-term impact of new additions and provide them with data for making an educated assessment of new museum addition proposals and projects in the future.

Rather than attempting to be a how-to guide on museum additions, this study offers decision-makers a new approach through its findings. In its conclusions, it also offers some recommendations for future museum expansion projects. These recommendations include

investing in employee work environments, conducting more internal post-occupancy studies of non-public spaces in the museum, and giving serious consideration to the effects of museum fatigue that arise from the lack of public amenities, wayfinding, and accessibility issues. Inadequate amenities such as water fountains and seating, toilets that are hard to find, and signs that are hard to read or understand can be just as upsetting for the visitor, as a gallery with a famous work of art that is temporarily closed. Museums must work harder to provide these facilities for visitors to be more comfortable and satisfied during their visit. Daylighting in art galleries also plays a significant role in the occupant experience; the key to managing daylighting strategies in museums is finding the right balance between conservation, visual comfort, accessibility, and desired ambience. Museum administrators and architects must identify all these goals from the very beginning when planning new building additions.

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This dissertation would not have been possible without the support of my family and friends.

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In the course of writing this manuscript, my grandfather passed away at 95 years of age in Mumbai, India. I will always regret not being with him in his final days, but at the same time, I know he would have wanted me to stay focused on my work and keep moving forward. My grandfather continues to be my role model and source of inspiration.

I dedicate this dissertation to his memory.



## TABLE OF CONTENTS

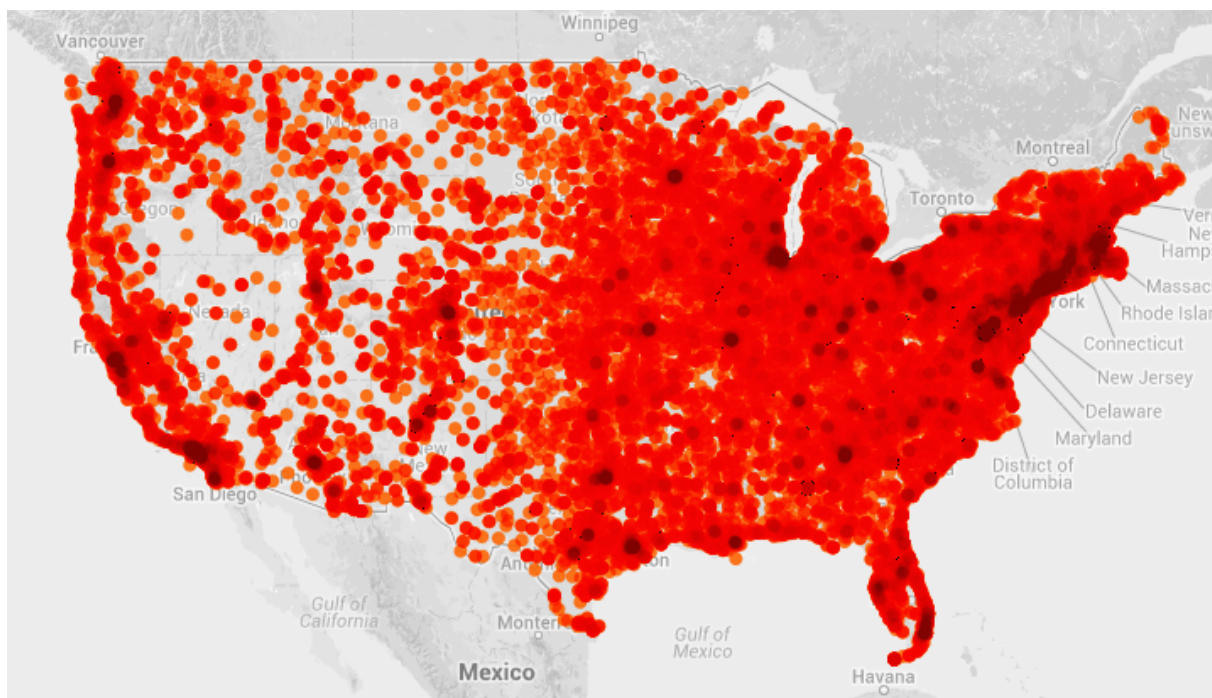
I. INTRODUCTION.....	1
The capitalist museum.....	7
Art museums as a badge of success.....	10
II. BACKGROUND.....	12
Awkward additions: The perils of “Starchitecture” in art museum design.....	12
Consideration of human factors in museum architecture.....	18
“Front Stage” and “Back Stage” areas of museum additions.....	26
III. RESEARCH STATEMENT.....	28
Making the case for human-centric and evidence-based museum design.....	28
Objective and significance of research.....	31
IV. CASE STUDY SELECTIONS.....	33
Case Study 1: The Metropolitan Museum of Art, New York .....	34
Case Study 2: The Art Institute of Chicago, Illinois.....	39
Case Study 3: The Nelson-Atkins Museum of Art, Kansas City, Missouri.....	44
Case Study 4: Phoenix Art Museum, Phoenix, Arizona.....	47
V. METHODOLOGY.....	50
Research limitations.....	50
Method 1: Content analysis of critics’ and public reactions to museum additions.....	53
Method 2: Questionnaire survey of museum employees.....	62
Method 3: On-site interviews of museum employees.....	67
Method 4: Unobtrusive observations.....	68
Method 5: Lighting measurements in front stage spaces and back stage spaces.....	70
Method 6: Visitor counts, space syntactic typologies, and on-site observations.....	73

Summary of research design.....	79
VI. RESULTS AND DISCUSSION.....	81
Part 1: Museum additions in the media: Content analysis results.....	82
Reactions to the building boom and the “Bilbao Effect” .....	89
Part 2: Survey results: Employee perceptions and experiences of back stage spaces and front stage spaces of the museum.....	94
Respondent Profiles: Length of employment and job description.....	94
Overall opinions of the museum addition(s).....	95
Workspace descriptions: Private vs. shared, single vs. multiple.....	97
Daylight and views.....	99
Satisfaction with various design attributes of the museum.....	107
Back stage spaces vs. front stage spaces.....	108
(Missed) Opportunities.....	117
Agreement/disagreement with critics’ statements.....	119
Summary of key findings from the museum employee survey.....	126
Part 3: On-site observations and interviews: Discussions on back stage spaces and front stage spaces.....	130
Museum back stage spaces: Artwork before people.....	130
Museum front stage spaces: The “Frankenstein effect of museum additions” .....	137
Accessibility.....	139
Wayfinding: Navigating “a giant complicated maze” .....	144
Museum fatigue.....	152
Museum cafés.....	160
Summary of key issues discussed in front stage spaces.....	164
Perceptions and experiences of some other architectural features.....	165

Part 4: Lighting measurements.....	195
Measurements in back stage spaces.....	197
Measurements in front stage spaces.....	201
Summary of key findings from lighting measurements in museums.....	211
Part 5: Visitation: Counts and observations.....	212
Annual attendance.....	213
Admission fees.....	218
Art galleries.....	222
Museum stores.....	229
Summary of key findings from the visitation study exercise.....	235
VII. CONCLUSIONS.....	237
Summary of key findings.....	239
General recommendations for new museum additions.....	242
Design recommendations for the four museum case studies.....	248
Concluding remarks.....	272
VIII. BIBLIOGRAPHY.....	273
IX. APPENDICES.....	284
Appendix A: Sample introduction letter to museums.....	284
Appendix B: Online survey administered to museum employees.....	287
Appendix C: Interview questions.....	293
Appendix D: Institutional review board (IRB) approval.....	296
Appendix E: Content analysis database.....	297

## I. INTRODUCTION

The American Alliance of Museums (AAM) reports that approximately 850 million visits occur each year to all museums in the USA, more than the attendance for all major league sporting events and theme parks combined (483 million in 2011). Further, Americans view museums as one of the most important resources for educating children, one of the most trustworthy sources of objective information — considered more reliable than books, teachers or even personal accounts by relatives, according to a study by Indiana University (as cited in the AAM ACME report). Museums preserve and protect more than a billion objects, employ more than 400,000 Americans, and contribute more than \$21 billion to the US economy every year. In the United States alone, more than 600 new art museums have opened since 1970 with similar trends in Europe (AAM).



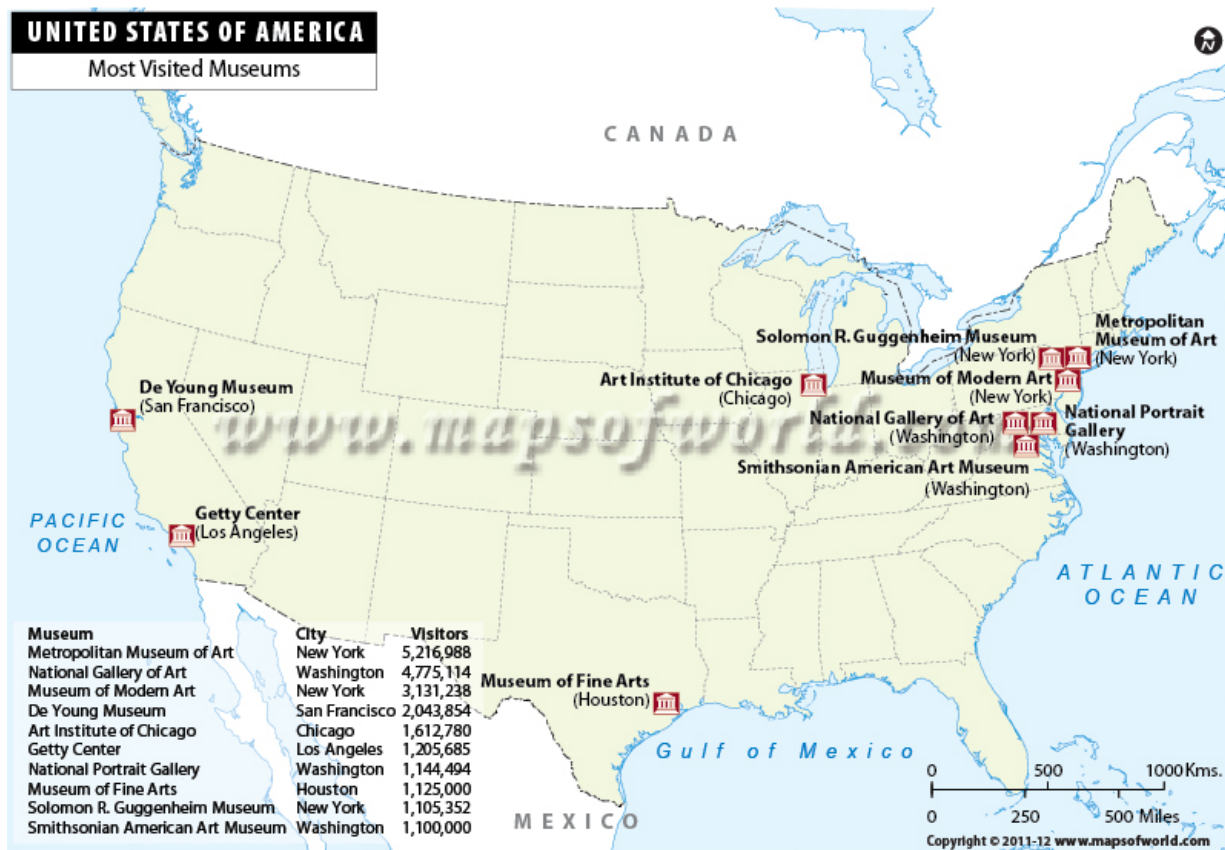
**Fig. 1.1:** Map of 35,144 museums in the U.S. Image source: Institute of Museum and Library Services, Museum Count Survey Project.

The Institute of Museum and Library Services (IMLS), has undertaken an extensive “Museum Count Survey” project to document every museum in the United States. So far, 35,144 museums have been counted and the map in figure 1.1 above represents their geographic location; each museum is represented by a red dot in the map. It should be noted that the IMLS considers a museum to be “anything trying to teach people about...a collection of something”, which includes aquariums, zoos, arboretums, historical societies and art galleries; however, it still the most extensive survey of museums in the United States that has been conducted so far (Badger, 2013).

This survey, even though a work in progress, gives a good idea of how and where these museums are concentrated in the United States. The Art Newspaper’s latest visitor attendance survey for the year 2013 and published in April 2014, notes the top ten most visited art museums in the world to be: 1. The Louvre, Paris, 2. British Museum, London, 3. Metropolitan Museum of Art, New York, 4. National Gallery, London, 5. Vatican Museums, Vatican City, 6. Tate Modern, London, , 7. National Palace Museum, Taipei, 8. National Gallery of Art, Washington DC, 9. Centre Pompidou, Paris, and 10. Musee d’Orsay, Paris. (Pes, J. and Sharpe, E., 2014).

Another survey by the Art Newspaper in 2012 (a 2013 survey was not conducted) notes the top ten most visited art museums in the United States to be: 1. Metropolitan Museum of Art, New York, 2. National Gallery of Art, Washington DC, 3. Museum of Modern Art, New York, 4. De Young, San Francisco, 5. Art institute of Chicago, 6. Getty, Los Angeles, 7. National Portrait Gallery, Washington D.C., 8. Museum of Fine Arts, Houston, 9. Guggenheim, New York, and 10. Smithsonian American Art Museum, Washington D.C. (Art

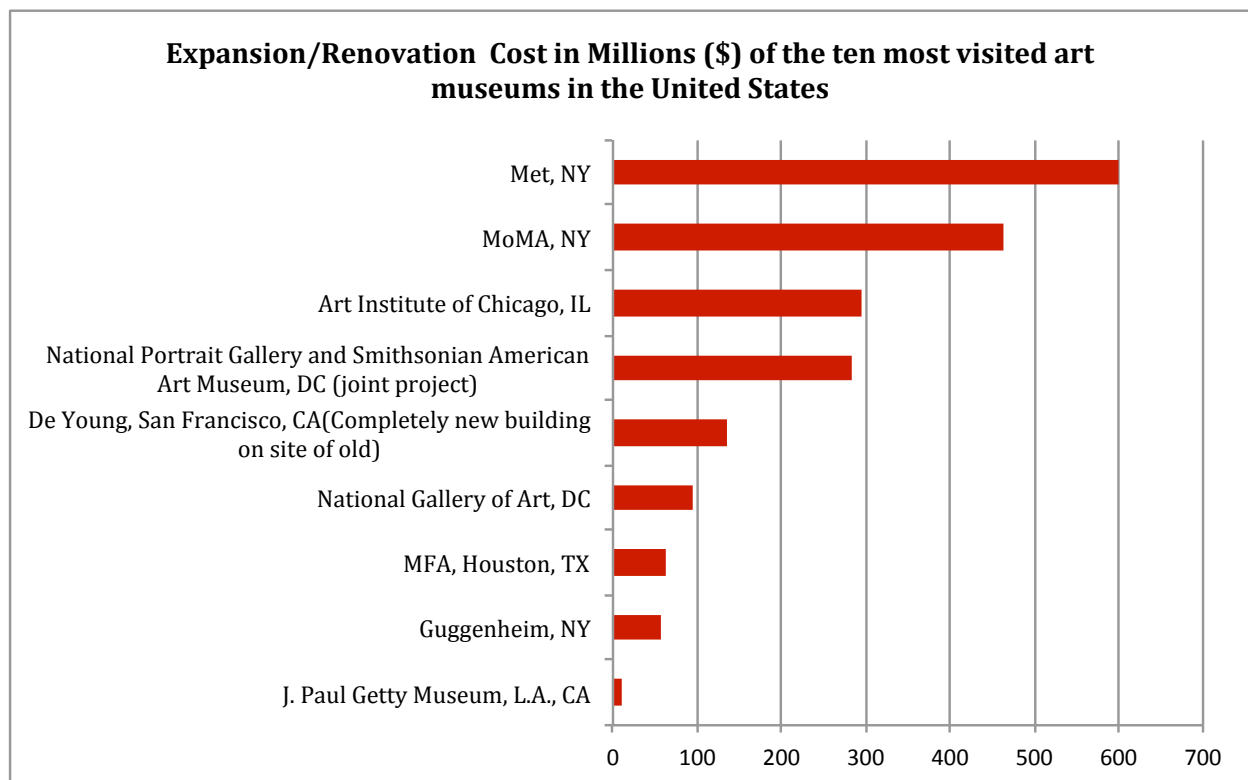
Newspaper, 2013). The map in figure 1.2 below from the website [www.mapsofworld.com](http://www.mapsofworld.com) shows the geographic locations of these museums in the United States:



**Fig. 1.2:** Map of the ten most visited museums in the U.S. Image and their annual visitor attendance. Source: "Maps of World", [www.mapsofworld.com](http://www.mapsofworld.com)

Maps of World does not mention where it gets its data for visitor counts, but the list of top ten art museums shown on the map matches the latest survey listings in the Art Newspaper's Exhibition and Museum survey of 2012. It is interesting to note that all these art museums have undergone significant expansions and remodeling at different times since they first opened to the public (The De Young in San Francisco, California was a completely new building built in 2005 after demolishing the old one that was badly damaged in the earthquake of 1989). The bar chart in figure 1.3 below shows the cost

comparison of their additions and renovation projects so far. (Cuno, J. B., Goldberger, P., Rosa, J., Turner, J. & Warchol, P., 2009; Danziger, 2008; de Young; Huxtable, 1978; Newhouse, 2006; National Portrait Gallery; Smithsonian). Recent data, in fact, suggests that by the middle of the first decade of the new millennium, *50 percent of all museums in the United States are involved in building construction, expansion or renovations* (MacLeod, 2013).



**Fig. 1.3:** Comparison chart of expansion and renovation costs for nine of the ten most visited art museums in the United States. Image source: author, with data compiled from Cuno et al, 2009; de Young, Huxtable, 1978, Newhouse, 2006, National Portrait Gallery, Smithsonian, and Getty Center websites.

Art has the power to lift the human spirit, and educate, and transform human beings. Art may be the “truest record of insight and feeling” and it is the “spearhead of human development, social and individual” according to many (Langer, 1966, p.5).

In his article “Resonance and Wonder”, Stephen Greenblatt (1990) discusses the power of

art objects as follows:

By "resonance" I mean the power of the object displayed to reach out beyond its formal boundaries to a larger world, to evoke in the viewer the complex, dynamic cultural forces from which it has emerged and for which-as metaphor or more simply, as metonymy-it may be taken by a viewer to stand. By "wonder" I mean the power of the object displayed to stop the viewer in his tracks, to convey an arresting sense of uniqueness, to evoke an exalted attention. (Greenblatt, pp. 19-20).

Art, however, is fragile and vulnerable; it faces risks from various destructive forces all the time, forces that are very often man-made. Museums as treasure-houses of art, are just as vulnerable as art itself, but this, according to Greenblatt (1990), makes their role even more vital to society:

Museums function, partly by design and partly in spite of themselves, as monuments to the fragility of cultures, the fall of sustaining institutions and noble houses, the collapse of rituals, the evacuation of myths, the destructive effects of warfare and neglect and corrosive doubt. (Greenblatt, 1990, p. 21).

The complex relationship between the content and container defines museum architecture even today, though the activity of collecting is older than the history of the museum and its architectural form, dating back to antiquity when collections did not require independent, separate structures. They were kept at sacred sites, sanctuaries or the residence of sovereign to embed them with power, knowledge, and worldliness. The Renaissance witnessed a renewed interest in collecting activities giving rise to different spaces such as the cabinet of curiosities, the studiolo, and the galleries for displaying and storing collections. Mid-eighteenth century onwards, royal collections in palaces in Europe became open to the public after they were taken over by the state following social and political revolutions in Europe, followed by independent museum buildings (Giebelhausen, 2011). In the mid-20<sup>th</sup> century, there was a shift from the universal public museum to specialized



art galleries and the art museum became a site where ceremony was marked by architecture.

Universality was replaced by individuality: the signature building increasingly became a trademark of museum architecture during the final decades of the twentieth century. (Giebelhausen, 2011, p. 234).

Museums have become increasingly popular and diverse institutions since the last quarter of the twentieth century, taking on a number of different roles. Shopping, eating, performances, fund-raising and urban revival have joined the ranks of exhibition and preservation as museum priorities (Newhouse, 2006). Museum architecture in turn, has taken on a range of stylistic modes and social roles, attracting the attention of 'star' architects, urban planners, and scholars, giving rise to a large body of literature in museum studies (Giebelhausen, 2011). Nikolaus Pevsner, a renowned scholar of the history of art and architecture, did not foresee this when he wrote in his famous book, *A History of Building Types*:

In fact, no new principles have turned up (in museum architecture), except that the ideal of the museum as the perfect place to show, enjoy and study works of art (or of history or of science). (1976, p.136).

In the years that followed, the idea that character and spirit could be molded by molding space and material became the core of the modern idea of the museum and art (Preziosi, 2011). Today, the success or failure of the twenty-first century art museum is judged by a variety of factors such as its art collection, educational and cultural importance, entertainment value, financial viability, and ability to attract visitors; factors which are directly influenced by its design.

## **The capitalist museum**

In her influential essay “The cultural logic of the late capitalist museum”, Rosalind Krauss (1990) identified a profound shift in the identity of museums and the increasingly corporate nature in which they operated. Now, in the twenty-first century, every year seems to bring in a new mega-museum; always bigger and better than the previous, “blockbuster” exhibitions, or a new museum controversy. Museums, though considered being vital for urban redevelopment and prime commissions for architects, have received wide criticism for their flamboyant developments and sacrificing their institutional integrity in times of economic recession (Kimmelman, 2002, 2004). They have also been criticized by the mainstream media for turning into theme parks or shopping malls — often denounced as “vulgar symbols of consumer-driven culture” (Mathur, 2005, p.700).

The new era of the capitalist museum is perhaps best embodied by Thomas Krens, the director of the Guggenheim museum who became known for his policy of aggressive museum expansion in the 1990s (Krauss, 1990). After arriving at the Guggenheim, New York, in 1988, he started an initiative called the “Global Guggenheim” unprecedented in the art museum world and oversaw a major expansion of the museum in the 1990s. Under Krens, the Guggenheim built new branches in New York, Berlin, Las Vegas, and Bilbao, followed by several “blockbuster” exhibitions at each of these museums (Mathur, 2005, p.700).

The international practices of the Guggenheim Museum have represented a significant globalization trend in museums, which have become popularly known as the “McGuggenheim Effect” or the “Bilbao Effect” in museum literature (Mathur, 2005, 2012).

This phenomenon has had an effect not only on the way that tourists choose their destinations, but also on the way that clients, especially museums, choose their architects who are usually the established, famous “stars” in the field—giving rise to a culture of museum “starchitecture” (Freudenheim, 2010). Kren’s commitment to global expansion raises the question of whether we really need Guggenheims all over world, and, if so, then whose interests they serve. So far, according to many museum critics, it has shown an incredible disregard for non-western cultural activities and spaces all over the world, turning the museum into a “brand” or a “product” that is meant to be exported (Mathur, 2005, p.701).

Along with mega-museums, we also see a rise in the number of mega-museum additions. Most of these are expensive, high-profile productions. In the U.S., for example, in 1978, the 126,000 square feet expansion by I. M. Pei to the National Gallery of Art in Washington DC the East Wing was completed at a cost of \$94 million (Huxtable, 1978; Sharp 2002). In Canada, Daniel Libeskind, a U.S. architect known for his design of the famous Jewish Museum in Berlin, designed “The Crystal”—a new 40,000 square-foot addition to the Royal Ontario Museum, which came at a price tag of \$120 million and opened to the public in 2007 (Freudenheim, 2010; Lasky, 2002). A new, \$125 million expansion to the Kimbell Art Museum in Fort Worth, Texas designed by the Italian architect Renzo Piano opened to the public in the year 2013. It is an 85,000 square-feet two story building facing the existing original by Louis Kahn, separated by a reflection pool and comprising of a 137 car underground parking garage, three new galleries, a 295-seat auditorium, a large lobby, reference library, and an education wing with a cafe (Robinson, 2010).

An overview of historical trends in museum development reveals that museum expansions are triggered by a combination of many factors; globalization being only one of them. The trend of new museums and museum addition construction coincides with a rise in arts philanthropy—even though modest—with support in 2012 up one percent from last year, according to the most recent Giving USA report (2013), prepared by the Center on Philanthropy at Indiana University. The one percent rise (from 4% in 2011 to 5% in 2012) amounting to a total of \$13.2 billion given to the arts, culture and the humanities, the Giving USA report noted, was mostly due to an \$800 million Walton Family (controlling shareholders of Walmart) Foundation endowment for the Crystal Bridges Museum of American Art in Arkansas, and documented by Giving USA as the largest cash donation ever awarded to an art museum in the United States (Olson, 2013). An increase in art endowments leads to an increase in acquisitions by museums. Or very often, private collectors donate their art collections to a museum. Recently, cosmetics billionaire Leonard Lauder was reported to have donated his entire collection of Cubist artworks—which includes 33 Picassos—to the Met, estimated to be worth at least \$1.1 billion by Forbes and recorded as one of the largest donations in history (Melby, 2013). With increasing collections, museums run out of space to display artwork. It also tends to be easier to find funding for new museums and new museum wings rather than the restoration of an older, existing building (Newhouse, 2006). *Why not invest in a building that is new and cutting edge instead of one that is old and uninteresting?*

## **Art museums as a badge of success**

In many cases, practical matters have overshadowed the quality of the architectural design. As Richard Oldenburg, director of the Museum of Modern Art New York, from 1972-1994 noted, new people usually wanted new things and physical expansion provided a way for new trustees, or a new director, to leave a permanent imprint on the building (Newhouse, 2006). In order to satisfy donors' needs or a director's or trustee's personal ambitions, architects for museum expansions are often selected without the usual board or committee approval. In the Metropolitan Museum of Art, for instance, the president and benefactor Robert W. De Forest selected his own architect—Grosvenor Atterbury in 1919, to create plans for further expanding the older facility that was first established in 1880 and had already undergone numerous expansions and renovations since then (Heckscher, 1995). The Met, so far, appears to have demonstrated an unconditional commitment to satisfy its donors' demands by undertaking a series of expansions and remodeling throughout the twentieth century and into the twenty-first (Heckscher, 1995; Newhouse, 2006). Its most recent renovation project includes a complete overhaul and refurbishment of the outdoor plaza and its two oval fountains facing Fifth Avenue in Manhattan and a significant upgrade to the museum's exterior lighting. Not surprisingly, the construction, which is already underway, is funded by a \$10 million donation by billionaire David Koch, a board member of the Met since 2008. Mr. Koch who after getting inspired by the new fountain of the Lincoln Center, went up to the Met's president Emily Rafferty telling her he wanted "to do something nice for the museum" (Orden, 2010, p.1).

Paul Goldberger, renowned architecture critic, summarized the trends of museum growth and expansion succinctly in an article in the New York Times:

Many (museums) became caught up in a frenzy of growth that had something other than the democratization of art as its goal. Building museums became a badge of success for cities, and for people who had grown rich in the 1980's. New blood, often newly rich blood, joined old museum boards. Museums got bigger and more expensive to maintain, which in turn required them to find ways of keeping attendance high to pay mounting bills. Many seemed victims of their own success, caught in a spiral of expanding audiences, expanded facilities and the need for ever more money to support them. (1994, p.2).

## II. BACKGROUND

### **Awkward additions: The perils of “Starchitecture” in art museum design**

In case anyone has forgotten, in the rash of overwrought, over-the-top museum additions following but never equaling Frank Gehry's spectacularly successful Bilbao Guggenheim, the art and architecture of museums should have more than an adversarial relationship in which a game of one-upmanship is played between the two. (Huxtable, 2012, para. 1).

Many museum expansion projects have been criticized for their lack of architectural integrity; unexpected in institutions that stand for the highest standards of art and preservation. Museum architecture always seems to be caught up between prioritizing the content (art) and the container (museum building). The dilemma of art versus architecture which continues to be discussed in museum literature (Freudenheim, 2010; Newhouse, 2006) and the popular press (Goldberger, 1994), has historical reasons for its existence. The shock of modernization and the horrors of two world wars in the 20th century were followed by a retreat into the values of the past. Art museums came to symbolize this withdrawal and made it possible. Postwar society was yearning for self-renewal through secure models on which it might be based, architects took up this challenge, reevaluating museum buildings and advocating for the representation of older art using modern architectural means in which buildings demonstrated a classic modernist view that claimed that architecture itself is art. For example, the Centre Georges Pompidou in Paris designed by Renzo Piano and Richard Rogers (1977) redefined the role of the traditional museum (Davis, 1990). It gave the impression of being a massive high-tech building, symbolizing culture that consisted of vast, noisy spaces, with crowds of people where all contemplation of art was effectively nullified (Lampugnani, V. 2011).

In 2004, the Museum of Modern Art (MoMA), New York re-opened after significant redesign and additions by the Japanese architect Yoshio Taniguchi. Taniguchi negotiated the complex urban site in New York City by opting for a monumental but restrained modernism (Evans, 2004, Giebelhausen, 2011). His goal was to “make the architecture disappear” and asserted that “architecture should not compete with the work of art” (Swanson, 2004, p.2). His design, however, received mixed reactions from critics. While it was applauded for its refined modernism (Evans, 2004; Mitchell, 2005), it was criticized for lacking the playfulness considered to be the hallmark of a postmodern museum visit (Krauss, 1996).



**Fig. 2.1:** Part of MoMA’s additions and renovation by architect Yoshio Taniguchi. Shown here is the new sculpture garden and education center. Image source: author.

Daniel Libeskind’s new addition to the Royal Ontario Museum (ROM) which opened in 2007, however, received stronger reactions by critics (see Fig. 5 below). The addition,



known as “The Crystal”, was described as an architecture that demonstrated “a lack of control” and overwhelmed the visitor, appearing to jut out onto the streetscape and attach to the old Canadian/Victorian brick building in an arbitrary manner (Freudenheim, 2010, p.412), provoking comments describing it as “a spaceship that crashed into the old building” (Wilkin, 2007, p. 445).



**Fig. 2.2:** The Michael Lee-Chin Crystal Wing addition to the Royal Ontario Museum, Canada, 2007, by Daniel Libeskind. Image Source: Freudenheim, T. L. (2010).

The awkwardness of this addition’s exterior continues into its interior spaces, which are uncomfortable for visitors and unsuitable for the material on display. Since the ROM is a natural history museum, its displays consist of dinosaurs, mammals and non-western cultures in fairly conventional rectilinear vitrines which are placed awkwardly in galleries whose shapes and design have no orthogonal angles whatsoever, much to the annoyance of the exhibit viewer (Freudenheim, 2010). After many examples of “titanium swirls” and “colliding forms” (Rybczynski, 2002, p.1), the shock value and effect of “Starchitecture” begins to fade:

Buildings are built for the ages. They are not one-night stands, like blockbuster movies or blockbuster art shows...The "wow factor" may excite the visitor and the journalist, but it is a shaky foundation on which to build lasting value. (Rybczynski, 2002, p.4).

The Manchester Art Gallery in UK was redeveloped between 1998 and 2002 with the ambitious theme of "Bridging the Past" at a cost of £35 million. Besides a physical redevelopment to existing gallery spaces, the renovation by Michael Hopkins & Partners included a new glass staircase bridge that linked the nineteenth century gallery and a new extension (MacLeod, 2005). The glass bridge shown in figure 2.3, even though symbolic to theme, received an ambivalent response from visitors. Research on visitors to the Gallery in 2002 revealed complex issues contrary to assumptions made during the design process.

Among a substantial number of visitors, the glass bridge between the nineteenth and twenty-first century buildings produced a sensation of unease and mild vertigo, and thus for these visitors became a barrier, rather than a link, between the old and new sections of the Gallery. (MacLeod, 2005, p. 111).



**Fig. 2.3:** Glass staircase bridge spanning the older art gallery and the new extension completed in 2002 by Michael Hopkins & Partners. Image source: Spring, M. (2002).

The additions to the MoMA, ROM, Manchester Art Gallery and other numerous well-known museums demonstrate how the museum's architectural articulation continues to oscillate between the two paradigms of monument and instrument; its aesthetic and functional considerations, which define the complex relationship the content and the container (Giebelhausen, 2011). They also show us how, in addition to the ongoing debate of art versus architecture, museum additions often get caught between the two desired goals of preservation of the historic urban fabric and refashioning the city's image — the challenge of presenting the new with the old, while maintaining continuity, and making a difference to human sensation, all at once. These considerations are crucial to understanding museum architecture and the architecture of its additions. However, they also leave us with

the questions: What is appropriate museum addition architecture? Should museum addition architecture completely abandon novelty for familiarity and comfort?

Without novelty and innovation, museum architecture would be dull and unworthy of the status of an important cultural landmark.. “Starchitecture” and mega-addition projects have shown us, however, how disastrous some of the bold and innovative (and sometimes bordering on the experimental) addition buildings can be. Museums are also places of rational entertainment where engagement with other cultures can occur for people to discover something new, and have encounters with authentic objects in a context that is respectful of their intelligence (Kimmelman, 2004). The best approach may be to find a balance between these considerations, as per critics and experts in the field (Byard, P.S., 1998) and in order to find that balance, there needs to be a rethinking of museum addition design with an environmental behavior approach; one that studies users’ needs in detail and demonstrates how architects’ designs can influence the quality of the human experience. It employs research methods that put maximum emphasis on occupants’ comfort and satisfaction in spaces (Zeisel, 2006).

## Consideration of human factors in museum architecture



**Fig. 2.4:** Visitors in the contemporary art gallery, second floor, in the Modern Wing, Art Institute. Image source: author.

The layout and quality of the museum is as important as the quality of its architecture or its collections because it impacts the sensory, social and educational experiences of visitors (Psarra, 2005). Space is a three dimensional kinesthetic experience punctuated by three dimensional objects. The museum space gets interpreted into a place with assigned meanings and challenges to see things in a new way (Lord, 2005). The physical space of an art museum is designed to tell the story through a variety of sensory means: spatial dimensions and sightlines, volumes and rhythms, forms, color, light, materials, sound etc., while the content is communicated more directly through still and moving images, and written and spoken words. These, in turn, prompt physical memories, ideas, and emotions that can also trigger dialogue and physical interaction (Austin, 2012).

As people make their way through museums, their resonance with ambient qualities such as light, color and space amplifies their energy, leading to positive body states that lead to positive mind states. Significantly, the resonance with the physical design of exhibits can also draw visitors towards content that they would not usually be attracted to (Roppola, 2012). In this respect, both visitors and museum spaces exercise agency in channeling processes: institutions assist visitors in forming channels, and visitors also work to forge channels through physical, perceptual and conceptual processes. Spatial channels and interior architectural attributes influence not only physical pathways but also affect direct visitors' focus, and have the potential to entice them through an unfolding sense of mystery (Roppola, 2012).

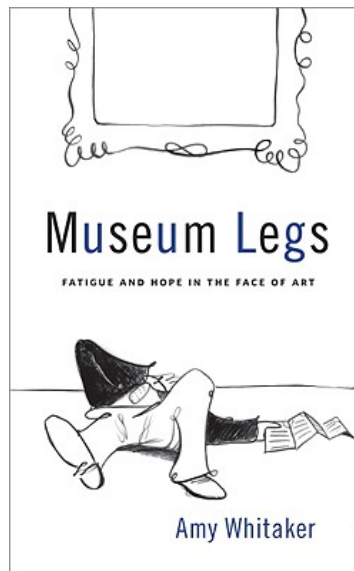
Orienting systems and wayfinding:

James J. Gibson's work (1966) challenged some of the commonly held beliefs in the fields of sensation and perception. Aristotle defined the five traditional human senses as sight, sound, smell, taste, and touch, but Gibson feels that perception is best understood in terms of systems rather than various independently operating sense organs. Instead of discussing "senses", he discusses the operation of five perceptual systems: the basic orienting system, the auditory system, the haptic system, the taste-smell system, and the visual system. Gibson primarily views these systems as mechanisms for seeking information, not simply for receiving information from the external world: "The perceptual systems, including the nerve centers at various levels up the brain, are ways of seeking and extracting information about the environment from the flowing array of ambient energy" (Gibson, 1966, p. 5).

The basic orienting system and the haptic system proposed by Gibson are in fact, crucial for any spatial experience. The basic orientation system is based on the relation between our vertical posture and the horizontal ground plane. The resulting orientation, according to him, causes us to seek a symmetrical balance and our senses are perpetually working to achieve this goal. The haptic system refers to our sense of touch which includes temperature, pain, pressure, and kinesthesia (body sensation and muscle movement) which implies that humans are always in physical contact with their environment (Gibson, 1966). From this we can infer that wayfinding and spatial mechanisms in museums as well as physical dimensions of spaces such as the width, length, and height of galleries and circulation spaces directly affect the way in which the body reacts and behaves.

Psarra (2005) notes that all museums deal with two fundamental problems in their operations: A route structure that facilitates encounters between exhibits and visitors, and spatial mechanisms that help in orientation and viewing buildings with their exhibits as a whole. Mega museums with mega additions that are characterized by a maze of long corridors and a dearth of seating can take a toll, even on the hardiest of museum visitors (Falk and Dierking, 1992). At some point, we have all experienced decreased attention spans, physical and mental exhaustion from prolonged museum visits – a phenomenon known as “museum fatigue” that is well documented in museum literature since the early 20<sup>th</sup> century (Gilman, 1916; Melton 1935; Robinson 1928).

Museum fatigue:



**Fig. 2.5:** Front cover of the book “Museum Legs” by Amy Whitaker. Image source: Whitaker (2009).

In her book “Museum Legs: Fatigue and Hope in the Face of Art”, Amy Whitaker (2009) through a collection of humorous essays takes a critical look at art museums and discusses questions such as why people get bored and tired in art museums – and why that matters. “Museum legs” – a term often used for art fatigue – asserts that museums nowadays, pay less attention to the way art is displayed or exhibitions are laid out and have become spaces that are more conducive to leisure business, and politics.

Whitaker in trying to connect with audiences through popular culture, may have taken criticism of art museums to an extreme, but the phenomenon of “art fatigue” or “museum fatigue” is very real. The term “museum fatigue” was first coined by Gilman (1912) who photographed effortful and strenuous behaviors by visitors when they looked at poorly designed exhibits. Bitgood (2009), however, contends that “museum fatigue” is a phenomenon that means much more than what is understood by previous studies (Davey



2005; Falk, Koran, Dierking, and Dreblow, 1985) and by using it as a broad generic term we encourage misconceptions of what it actually means. In addition to exhaustion, the term “museum fatigue” has been used to describe various other types of behaviors such as “cruising” – a phenomenon in which first-time or infrequent visitors of a particular museum view exhibits carefully for the first 30 minutes after which their attention decreases by about 10 percent, and finally reaches a lower threshold for the remainder of their visit (Falk et al, 1986). These studies, however, may be inaccurate according to Bitgood (2009), because of the “cueing” method that was employed i.e. visitors were aware that they were being observed and also because it ignored the attrition rate of visitors. Similarly, studies which link physical fatigue over an entire museum visit to viewing within a single exhibition may also be problematic (Bitgood, 2009). Museum professionals and scholars (Falk & Dierking, 1992) argue that “museum fatigue” is an unavoidable phenomenon, but other studies have found this to be incorrect. According to studies such as the post-occupancy evaluation of the Predator House at the Birmingham Zoo (Roper, Bitgood, Patterson, & Benefield, 1986), *museum fatigue can be avoided if we design the visitor experience effectively*. This study found no evidence of a decreased attention span across successive exhibit viewing, leading them to conclude that there were elements in the design that (though they did not isolate these specific elements).

Decreased attention or interest in fact, has not been found to be associated with physical or mental fatigue. It is therefore, important to distinguish between these behaviors and consider the likelihood of poor design as having an effect on decreased attention (Bitgood, 2009). Visitors can actively take measures such as finding an efficient viewing route and

taking fewer steps and more breaks in order to reduce museum fatigue, however, the architectural attributes of museum spaces need to be conducive to these measures.

Museum visitors make choices, often without awareness, but these choices can be made only if options are made available to them in the first place. Poor design of the museum, according to Bitgood (2006, 2009), is one of the many factors responsible for causing decreased attention and interest across successive exhibit viewing, along with other measures of museum fatigue such as selective viewing, choice, distraction, information overload, and the lack of adequate amenities such as seating in exhibition spaces and common areas. McIntyre (2009) in his study of the visitor environment of a renovated museum and art gallery in England, found that the provision of “leisure-time” and social spaces such as benches in exhibitions was important to counter the pressures of a commercial and highly technological consumer society for human wellbeing. Seating was found to be equally important, for an immersive, contemplative environment for personal reflection and imagining.

Galleries are about reflection and solitude and quality time. There are some people who come and sit here for hours. (McIntyre, 2009, p.159).

Results of a random survey of 115 visitors at the Cincinnati Museum of Natural History revealed that most visitors rated seating as a desired amenity in the museum between the categories of “important and “most important” (Boone & Britt, 1994). The provision of adequate benches and seating, unfortunately, is sometimes overlooked in much-publicized new museum wings and additions. Blair Kamin, prominent architecture critic of the Chicago Tribune, reported the lack of adequate benches in Renzo Piano-designed new

Modern Wing of the Art Institute (2009). The Toledo Art Museum in Ohio, on the other hand, incorporated the findings of a research study by Marilyn G. Hood (2004) that emphasized the need for public amenities in museums, in its planning and programming. By adding new graphics and comfortable seating in the museum lobby, it greatly improved visitor comfort, orientation, and experienced an increase in visitor attendance for its special exhibitions (Hood, 2004).

Visitors, of course, have one more option in order to counter museum fatigue and that is leaving the museum sooner than planned; something that the museum administration and artists presumably do not desire. Museum renovations and expansions have the potential to address this issue by creating new opportunities to revisit and redesign or create new spatial layouts that counter museum fatigue and enhance the visitor experience.

#### Accessibility:

The Americans with Disabilities Act (ADA) was signed into law in 1990 to provide equal opportunities to persons having disabilities, in everyday, mainstream life. As per ADA (2010), a disability is defined by the ADA as “a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment”. We must, however, consider disabilities from multiple perspectives; almost all humans experience a complete or partial loss of one or more of their abilities as part of the normal aging process as well as accidents throughout their lives (Kopec, 2006).

ADA is well-intentioned, but it specifies only minimum requirements for individuals with disabilities. Families with young children, especially those with strollers, are also often

unintended beneficiaries of ADA-compliant designs. Buildings, however, need to be designed above-and-beyond these minimum requirements in order to be easily accessible and comfortable for everyday use. University of Illinois at Urbana-Champaign Visiting Assistant Professor in Architecture Carl Lewis, an expert on accessibility issues and also a wheelchair user, said that the first thing he does in order to go up a building level is to look for an elevator and not a ramp. Ramps, according to him, are meant only for going down (comments he made when interviewed). Museums, just as other buildings in the United States, are required by the law to comply with ADA standards. But long ramps and corridors, an elevator that is hard to reach, narrow art galleries, and large buildings with only one accessible entrance that comply with ADA regulations, may not be suitable for everyday use. User feedback and surveys via post-occupancy evaluation are crucial, therefore, in order to go beyond ADA and create environments that are disability-compatible and comfortable for all occupants of the museum building.

#### Design and wellbeing:

Architecture and interior design can significantly improve occupants' wellbeing- we respond neurologically, psychologically, and physiologically to our environments and designs that affect our wellbeing, health and longevity. The presence of architectural attributes such as lighting, windows and views as visual stimuli in rooms have been found to improve positive mood, satisfaction and decrease mental fatigue in occupants (Leather, P., Pyrgas, M., Beale, D., & Lawrence, C., 1998; Stone, 1998). Visitors when tired or stressed, have the option of leaving the museum at any given time. Museum employees, however, do not have this option - they spend all day in museum front stage and back stage spaces. The

phenomenon of “museum fatigue” for visitors is well known and documented (Bitgood, 2009; Gilman; 1916); however, the same phenomenon needs be studied with respect to museum employees.

### **“Front Stage” and “Back Stage” areas of museum additions**

Erving Goffman, one of the most prominent and influential sociologists of the twentieth century, described a structural division of social establishments into “front” and “back” regions (1957). The front was considered to be a meeting place for hosts, guests, customers and service persons (reception offices, parlors, and the like) and the back- a place where members of the home team relaxed, retired or prepared (kitchens, boiler rooms, and similar) (Goffman, 1959). Although this division is based on social performance, it is supported by architectural arrangements (MacCannell, D., 1973). The front-back dichotomy of social structure proposed by Goffman (1959) can be considered to be extended to the social and physical settings of museum additions. The back stage region according to Goffman is closed to audiences and outsiders and allows concealment of props and activities that may discredit the performance in the front. Using this structure of division, we can consider the front stage of museum additions to be public areas such as art galleries, atria, courtyards, corridors, lobbies, cafes, restaurants, and museum shops, and back stage to consist of areas with limited or employees-only access such as offices, workshops, labs, and meeting rooms. While there have been many post-occupancy evaluations and visitor studies of front stage, public spaces in museums (Carbonell, 2012; Macleod, 2005, Macleod, Hourston Hanks, Laura, & Hale, 2012), POEs of back stage areas in museums are very few. This research aims to fill this void.

In the Methodology section (Chapter V), we will discuss how this study will employ post-occupancy, environmental behavior methods to measure the successes and shortcomings of existing museum additions from an occupant's point of view. The goal is to investigate whether museum additions result in the creation of better work environments or not, and how back stage areas of the museum addition compare to the front stage areas in terms of human factors and architecture features.

### **III. RESEARCH STATEMENT**

With increasing art collections, changing trends in architecture, improving design technology, and increasing globalization, museums are under immense pressure to expand by museum trustees, donors, museum members, the media, and the general public.

Previous studies of much publicized new museums have shown how architecture has dominated art and the visitor experience in many instances (Newhouse, 2006). Responding to the call of becoming more visitor-focused is in fact, one of the biggest challenges faced by museum professionals at the turn of the 21<sup>st</sup> century (Hooper-Greenhill, 2011). The current examples of building additions to iconic, internationally renowned museums reflect a global trend of exorbitant design, construction, operating and maintenance costs that require great justification especially as much of the world is still emerging from the throes of a deep economic crisis. Additions cause change, and change brings with it an element of risk in its reception by visitors (Roppola, 2012). We need to study how change in museums can be engineered to reach their goal of expanding audiences and deepening connections with them, while still maintaining their attractiveness and functionality, and minimizing risk financially.

#### **Making the case for human-centric and evidence-based museum design**

Books on museum design so far have focused mainly on architectural features (Bayerische, 2009), exhibition design (Macleod, 2005), museum gallery lighting (Cuttle, 2007), interiors (Naredi-Rainer & Hilger, 2004) or individual "starchitect" achievements (Foster, Sudjic, and De Grey, 2001). Others examine visitor studies, socio-cultural and anthropological issues (Carbonell, 2012; Macdonald, 2006) or provide a historical overview of the field of

museology (Macdonald, 2006). Very few environmental behavior studies of museum additions — if any — address how they influence occupants' experiences and perceptions; most studies have simply relied on annual visitor attendance and membership numbers. Creating more awareness of the human components of these additions is much needed.

We have discussed how in numerous existing museum spaces, aesthetics have taken precedence over occupant experience and comfort. We need to find more about visitors' and museum employees perceptions about museum addition design through their experiences and opinions and investigate the impact of museum additions on the overall spatial layout and quality of the museum. This involves studying not only the museum front stage areas on public display such as art galleries and exhibits but also going behind the scenes and finding out how curators, administration staff, security guards, gift shop attendants, gallery docents, and directors experience museum design.

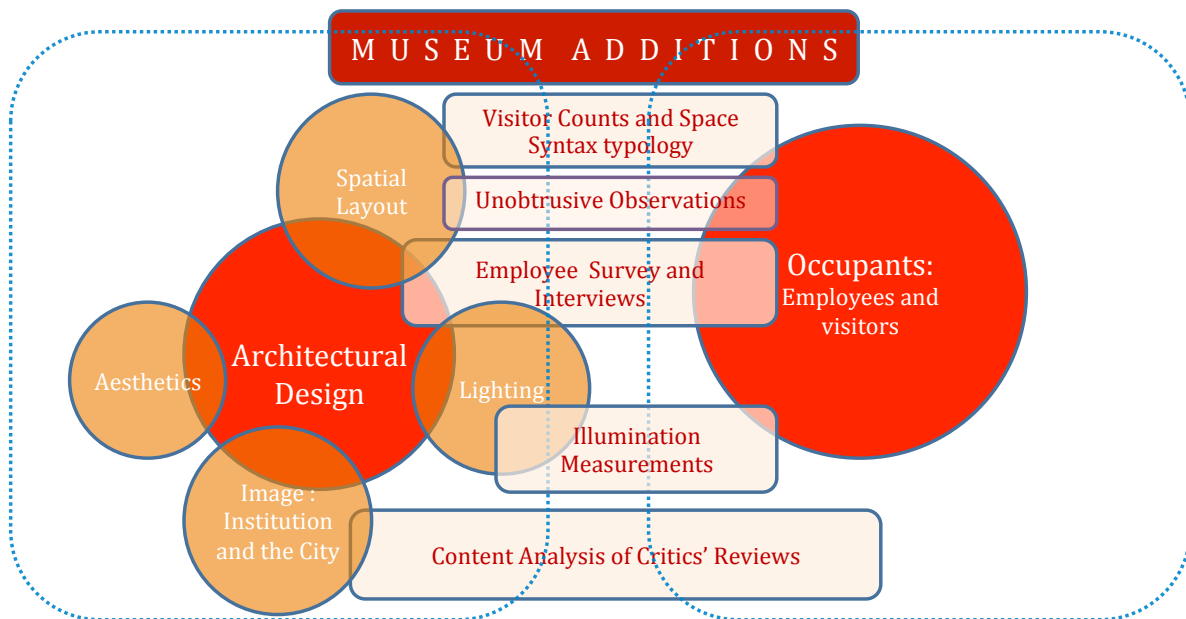
All these concerns set the stage for the following research questions:

1. How does the museum addition design affect occupants (visitors and museum employees) in terms of:
  - a. Their experience and perception of “front stage” areas (museum public spaces and exhibitions)?
  - b. Their experience and perception of “back stage” areas (employee work spaces)?
2. How does the museum addition design affect the museum (as an institution) in terms of:



- a. Architecture: spatial layout, aesthetics and quality? How does the new building engage with the existing one?
- b. Image: How is the 'new' museum perceived by critics, residents, tourists and museum staff? Does it alter the image of the city?

The research design and methodology of this study is summarized by the infographic below in figure 3.1, along with its proposed methodology. Each method is described in detail in the Methodology section.



**Fig. 3.1:** Summary of proposed research design and methodology of the study.

## **Objective and significance of research**

The American Alliance of Museums reports that museums generate billions in revenue through indirect spending by their visitors (AAM- Museum Facts). The latest Annual Condition of Museums and the Economy (ACME 2013) survey conducted by the AAM found that American museums had more visitors in 2012 than 2011. As per ACME 2013:

A majority of museums in the survey (52%) reported increases in annual onsite attendance — in some cases, a boost of 20% or more — while just 28% experienced declining attendance; the rest maintained a steady level of visitors. (p. 1).

Revenues generated from rising museum attendance and sales, along with the large sums of money spent on design, construction, operation and maintenance costs for these additions require greater accountability of design professionals and museum institutions towards their employees, visitors, patrons and benefactors.

How can the results of this study be used to develop human-centric design (design that puts maximum emphasis on human welfare) and evidence-based design (design based on credible, collected evidence from systematic studies) guidelines for future museum expansion projects? How can a new wing or addition engage with the existing museum building in a meaningful dialogue? The findings of this study inform stakeholders in museums about the short term and long-term impact of new additions and provide them with a tool for making an educated assessment of new museum addition proposals and projects in the future. They aim to generate a discussion that will not only illuminate current problems, but also suggest solutions, and present some practical guidelines for museum additions that will be beneficial to design professionals, museums, and organizations for the optimal design of future museums and museum addition projects.

Designing buildings that address all the needs of all occupant groups is a formidable task, but it is one that may pay off in the long run. From all the discussions so far, we know this for certain: taking occupants' (visitors and staff) needs into account when designing addition buildings will not only make museums more desirable places to work and visit, but also generate more revenue for institutions; making these projects even more financially viable over a long period of time.

#### **IV. CASE STUDY SELECTIONS**

The Metropolitan Museum of Art, New York (eight additions between 1970-2007), the Art Institute of Chicago, (three additions between 1970-2009), the Nelson-Atkins Museum of Art, Kansas City, Missouri (the Bloch building addition in 2007), and the Phoenix Art Museum (two additions—one in 1996 and one in 2006); four well known museums, two of which—the Met and AIC—are also the two largest museums in the United States at 2 million square feet and 1 million square feet respectively (Blandford, 2012; Goldberger, 2007; Heckscher, 1995), were the four case studies selected for this research. The three additions of the Art Institute by architects Renzo Piano, Thomas Beeby, and Walter Netsch; the Bloch building addition to the Nelson-Atkins Museum by architect Steven Holl; the Phoenix Art Museum's two additions by architects Todd Williams and Billie Tsien; and the Met's eight additions over the years by a single architectural firm—Kevin Roche John Dinkeloo & Associates have received critical acclaim in popular media and museum studies literature (Blair, 2009; Cuno et al, 2009; Danziger, 2008; Goldberger, 2007, Newhouse, 2006). Together, they represent prime case studies that align with the research objectives. Each case study with the original museum building and its additions, are briefly described in this section.

## Case Study 1: The Metropolitan Museum of Art, New York



**Fig. 4.1:** News headline announcing the opening of the new American Wing at the Metropolitan Museum of Art, New York by architecture critic Ada Louise Huxtable. Image Source: Huxtable (2012), The Wall Street Journal.

The news headline shown in figure 4.1 above appeared in the Wall Street Journal in January 2012, and was followed by a favorable review of the new American Wing in the Metropolitan Museum of Art by renowned architecture critic Ada Louise Huxtable (Huxtable, 2012). Since 1874, when its site was first established on the grounds of Central Park, the building of the Met has undergone an almost continuous expansion, construction, and remodeling. The original building which opened to the public in 1880 was designed by the architect duo of Calvert Vaux and Jacob Wrey Mold. Since then, over a dozen architectural firms have worked on its design and five master plans have been approved, however, the designs of architects Richard Morris Hunt, Charles Follen McKim, and Kevin Roche are largely responsible for the way that it looks today (Heckscher, 1995).

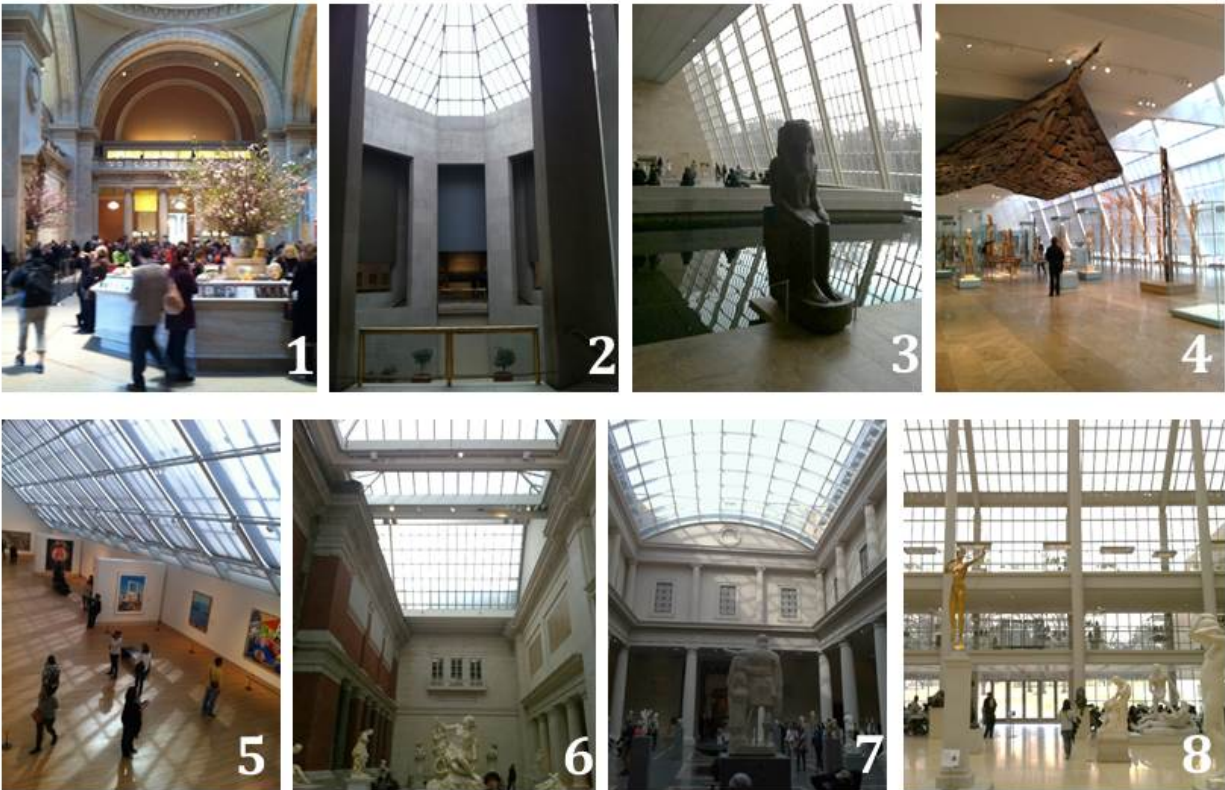
The Met, despite its transformations through the years, remains one of the most popular museums in the world and has become the number one tourist attraction in New York (Danziger, 2008). As reported by the Art Newspaper, it received 6.1 million visitors in 2012, second only to the Louvre in Paris which received 9.7 million visitors (as cited in Kennedy, 2013). It is also the largest museum in the United States occupying an area of about two million square-feet as of 2015 (Blandford, 2012; Danziger, 2008).

Architect Kevin Roche has been the Met's resident architect for more than 40 years, ever since he designed the master plan for the museum in 1967 (Pogrebin, 2007). From 1970 to 2007, his firm Kevin Roche John Dinkeloo and Associates (KRJDA) has designed eight additions and renovations for the Metropolitan Museum, almost doubling the its size to approximately four city blocks and two million square feet (Danziger, 2008; de Montebello, 1994). The eight additions and alteration projects by Roche that comprise the focus of this study are: 1. The Great Hall and the Front Plaza (1970, 30,000 square-feet), 2. Robert Lehman Wing (1975, 25,000 square-feet), 3. Sackler Wing (1978, 33,000 square-feet) and Remodeled Egyptian Galleries (1983, 100,000 square feet) 4. Michael C. Rockefeller Wing (1982, 170,000 square feet), 5. Lila Acheson Wallace Wing (1987, 70,000 square-feet), 6. Henry R. Kravis Wing and Carroll and Milton Petrie European Sculpture Court (1990, 148,000 square feet), 7. Greek and Roman Sculpture Galleries (2007, 60,000 square feet), and 8. American Wing and Charles Engelhard Court (1980+additional renovation in 2012, 175,000 square feet). In total, these additions and renovations have cost between \$500 million and \$600 million to date (Heckscher, 1995; Newhouse, 2006; Pogrebin, 2007).

The 1970 Met master plan by Kevin Roche and the eight subsequent additions by his firm KRJDA spanning more than four decades are shown in figures 4.2, 4.3, and 4.4 on the next page:



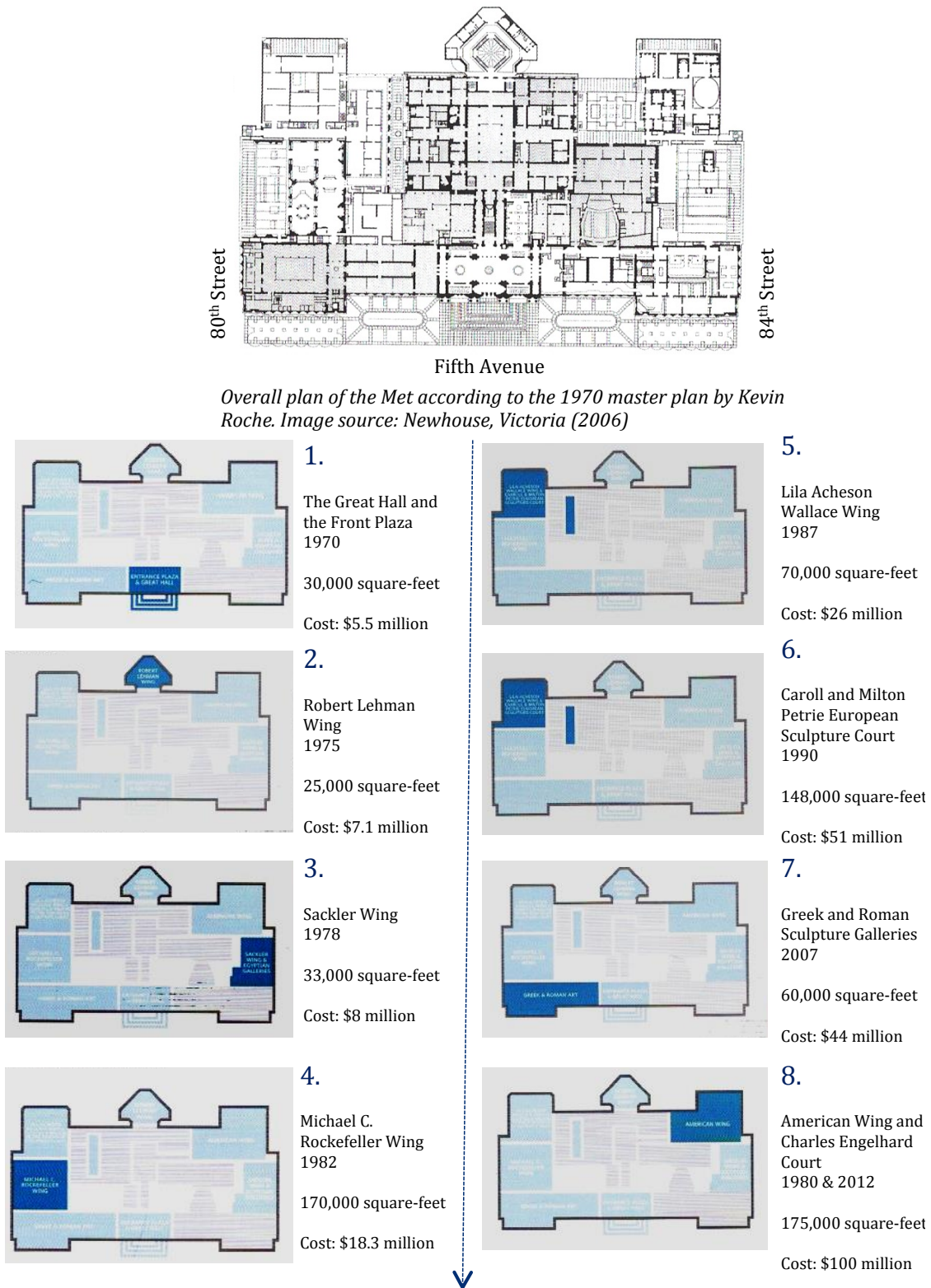
**Fig. 4.2(above):** Aerial view of the Met, sitting in Central Park, Manhattan with its front along Fifth Avenue with all eight additions are clearly visible. Image source: de Montebello (1994, p.2).



**Fig. 4.3(above):** The eight additions of the Met by KRJDA from 1970 to 2012: 1. The Great Hall and the Front Plaza (1970), 2. Robert Lehman Wing (1975), 3. Sackler Wing (1978) and Remodeled Egyptian Galleries (1983), 4. Michael C. Rockefeller Wing (1982), 5. Lila Acheson Wallace Wing (1987), 6. Henry R. Kravis Wing and Carroll and Milton Petrie European Sculpture Court (1990), 7. Greek and Roman Sculpture Galleries (2007), and 8. American Wing and Charles Engelhard Court (1980+additional renovation in 2012). All images taken and compiled by author.



## The Metropolitan Museum of Art, New York City, NY and its eight additions from 1970-2012



**Fig. 4.4:** The 1970 master plan of the Met by Kevin Roche (shown on top) and its eight subsequent additions by KRJD with an approximate total cost of \$500 to \$600 million. Infographic created by author with images from Heckscher (1995) and Newhouse (2006).



The Met's numerous additions over the years have given it an almost unprecedented level of complexity in terms of wayfinding and connectivity. Philippe de Montebello, the Met's director from 1977-2008, who oversaw the construction of most of Roche's additions, acknowledged that the museum's opportunistic growth had created "a remarkably confusing floor plan — a patchwork quilt of disconnected spaces" (de Montebello, 1994, p. 21). He emphasized, however, that the Met was in fact, "a collection of many museums, each deserving of many repeated visits," providing an infinite number of options under one roof.

The strength of the Met is that all under one roof it provides an almost infinite number of options for many rich and rewarding visits...the Met can never be too big...as with a long menu or a box of assorted chocolates, the more we have to choose from, the better. (de Montebello, 1994, pp. 6-9).

This philosophy of the Met's leadership, though, has not silenced museum and art critics who have said that the Met, as one of the leading museums of the world, has set a poor standard for other institutions. "As it happens, practical concerns (at the Met) have repeatedly overshadowed a concern architecture quality" (Newhouse, 2006, p. 140).

The complexity of the Met's layout due to its numerous additions over the years along with the mixed reviews and reactions that it has received from critics and museum-goers made it the first choice for this study.

## Case Study 2: The Art Institute of Chicago, Illinois

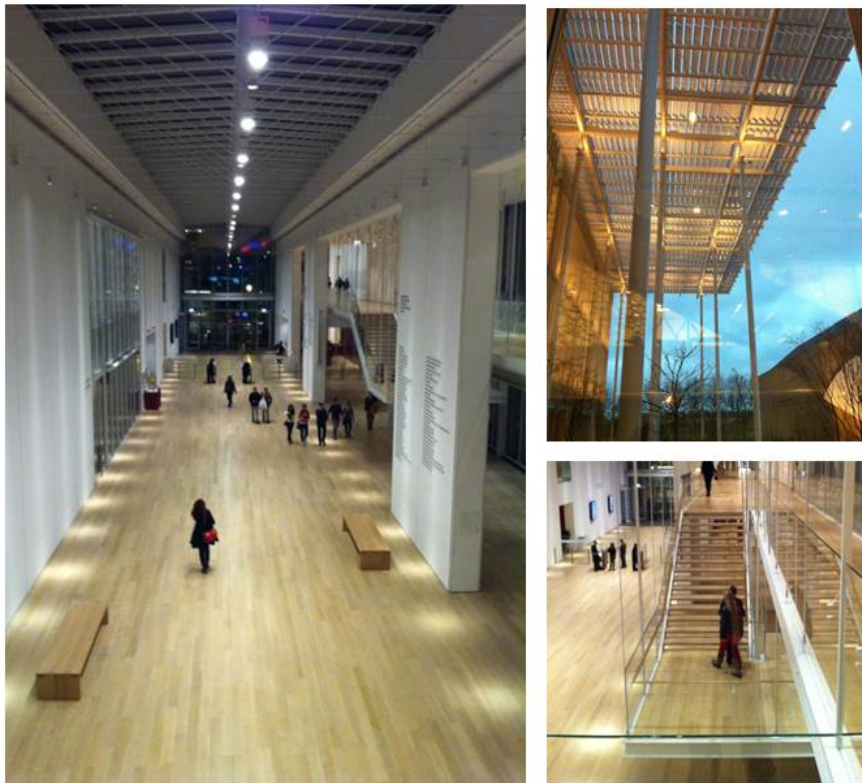


**Fig. 4.5:** News caption in the Wall Street Journal announcing the opening of the Modern Wing at the Art Institute of Chicago. Image source: Rosenbaum (2009), Wall Street Journal

The news caption in the Wall Street Journal shown in figure 4.5 above preceded an article that reviewed the new Modern Wing of the Art Institute of Chicago after it opened its doors to the public in May 2009, making the Art Institute the second largest museum in the United States, after New York's Metropolitan Museum of Art. The 264,000-square-foot addition designed by the famous Italian architect Renzo Piano was constructed at a cost of \$294 million. It is the largest expansion in the Art Institute's 130-year history, increasing the institution's space by 35%, to 1 million square feet (Blandford, 2012; Liebenson, 2010). The Modern Wing includes over 65,000 square feet of new galleries around a two-story atrium and houses a new 20,000-square-foot education center, temporary exhibition space, an interior garden, an open-air sculpture terrace, and visitor amenities including a museum shop, café and restaurant (Cuno, J. B., Goldberger, P., Rosa, J., Turner, J. & Warchol, P., 2009). Some images of the addition and renovation project designed by RPBW (Renzo Piano Building Workshop) are shown in figures 4.6 and 4.7 below:



**Fig. 4.6:** The Modern Wing, Art Institute of Chicago as seen from Monroe Street. Image source: author.

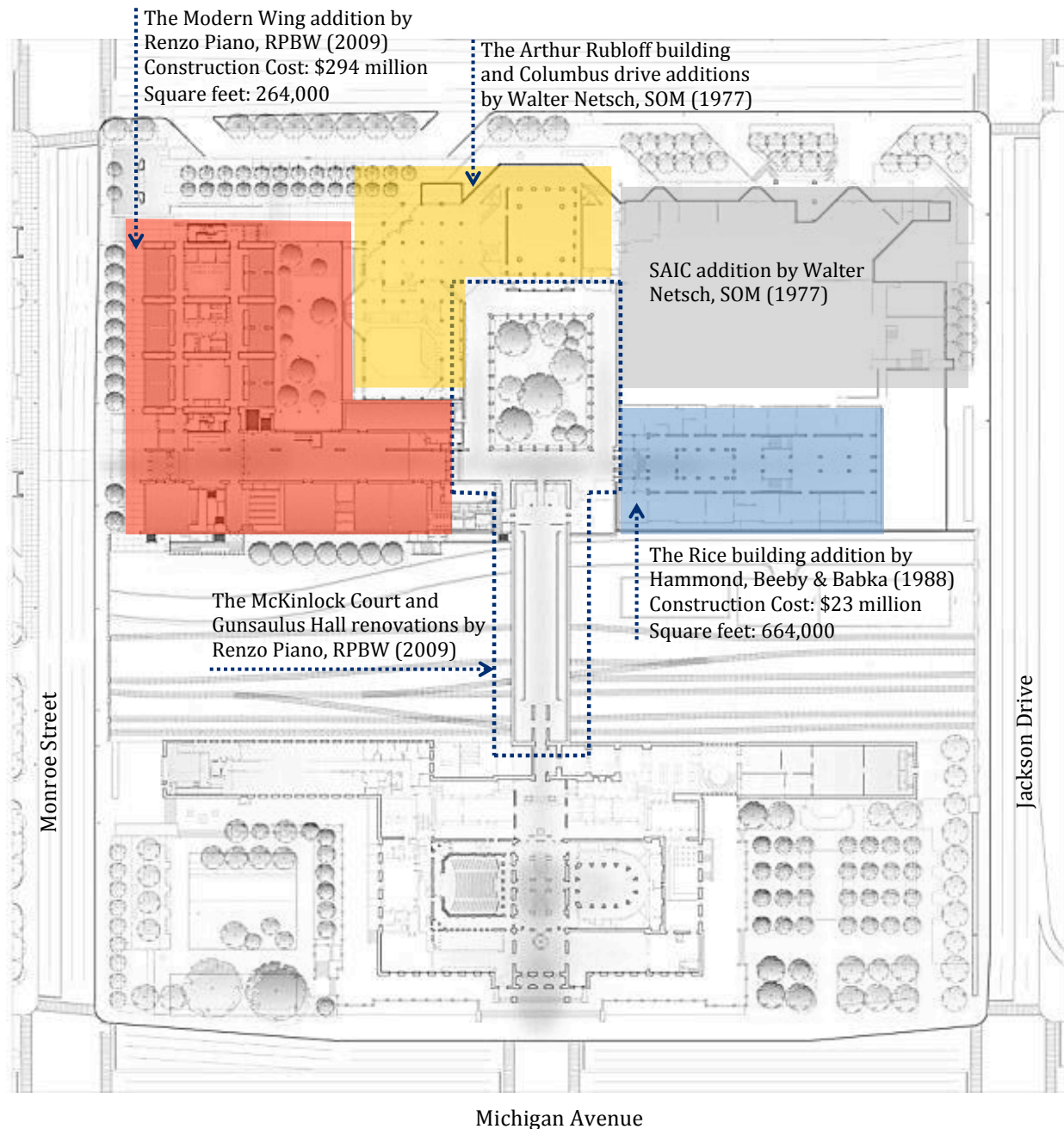


**Fig. 4.7:** Inside the Modern Wing, Art Institute of Chicago. Clockwise from left: The Griffin Court, Pritzker Garden, and stairs connecting galleries on second and third floors. All images by author.

In a city that is known internationally for its architecture, the Modern Wing has received praise for its aesthetic, structural design and daylighting amongst other things (Blandford, 2012; Cuno et al, 2009). But in addition to praise, it has also received some criticism. Blair Kamin, longstanding architecture critic of the *Chicago Tribune*, noted that even though the architecture and natural lighting of the new Modern Wing was impressive overall, it required some modifications because visitors complained about lighting issues; paintings or art objects that were dimly lit, poor circulation and connectivity between spaces and lack of sufficient benches in art galleries (Kamin, 2009). Piano's vision for the museum was for it to be much more than additional art galleries. It needed to be, in his opinion, a space that provided its visitors with a more coherent experience, a space that could be used for gathering and a point from where one could go off to visit different parts of the museum (Cuno et al, 2009). This study will reveal whether Piano's original vision for the museum and that of its board of trustees has been realized in its construction and its function, and to what extent criticism regarding its circulation, lighting, and other attributes is justified.

The Modern Wing, however, is only the most recent of nine additions that the original AIC building has received through the years 1901 to 2009. In order to keep the timeline of additions in the AIC consistent with that of the eight Met additions, this study includes two other additions to the original building since 1970: the Columbus Drive addition and School of the Art Institute by the architecture firm Skidmore, Owings & Merrill (SOM) that opened in 1977, and the Daniel F. & Ada Rice Building by Hammond, Beeby & Babka that opened 11 years after that in 1988 (Hogan, 2009; Sinkevitch & Peterson, 2004). Both these additions along with the Modern Wing will be studied as part this research. A diagram showing the extent of three additions is shown in figure 4.8 below:

### The Art Institute of Chicago, Chicago, IL and its three additions from 1977-2009

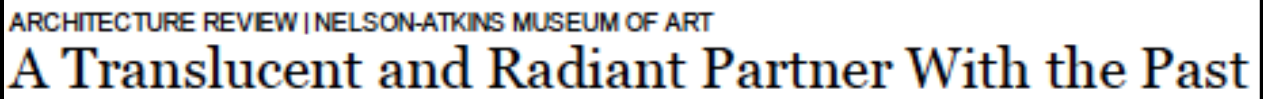


**Fig. 4.8:** Art Institute of Chicago layout depicting the extent of three additions. Infographic by author with image from <http://www.fondazione-renzo-piano.org>.

The Art Institute responded to the increase in the number of students and visitors in the 1970s with an entirely new east side expansion—the Arthur Rubloff building by architect Walter Netsch of SOM that included new studios, classrooms, a film center for the School (SAIC), and new public spaces for the museum. This addition is also known for housing the reconstruction of Louis Sullivan's original Chicago Stock Exchange Trading Room, which was saved when the building had been slated for demolition (Cuno et al, 2009).

While the SOM addition was a modern building with travertine and glass, the Rice Building by architect Thomas Beeby marked a return to classical architecture in the Beaux-Arts style. The limestone sheathed structure comprised of 664,000 square feet and named after its donors Daniel F. and Ada L. Rice who contributed \$10 million of its \$23 million cost. It was built to accommodate the dramatic increase in the museum's contemporary art collection and increasing popularity of large travelling exhibitions and still houses the largest art gallery in the museum as of today—the Regenstein Hall, as well as the American art collection (Goldberger, 1988). The project's architect, Mr. Beeby, also the former Dean of the School of Architecture at Yale, has spoken of his design as an attempt to "reinforce what we think are the best aspects of the Art Institute." (Goldberger, 1988, p.1).

### Case Study 3: The Nelson-Atkins Museum of Art, Kansas City, Missouri



## ARCHITECTURE REVIEW | NELSON-ATKINS MUSEUM OF ART A Translucent and Radiant Partner With the Past

**Fig. 4.9:** News caption in the New York Times announcing the opening of the Bloch addition to the Nelson-Atkins Museum of Art, Kansas City in 2007. Image source: Ouroussoff (2007), New York Times.

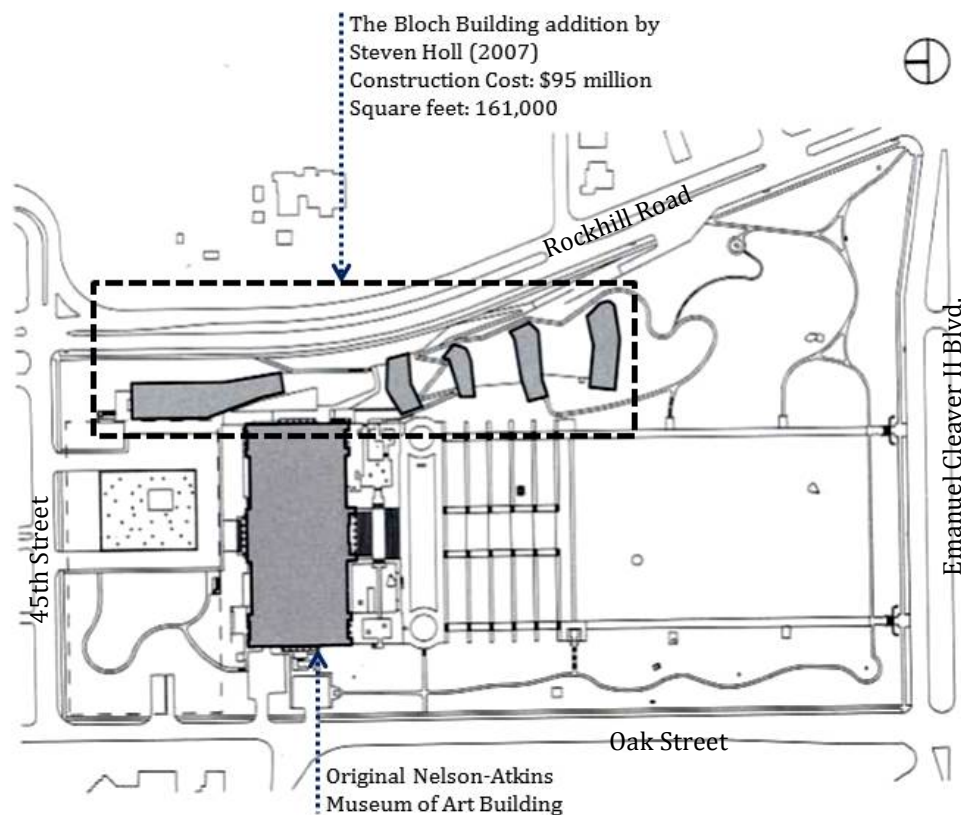
The selection of world-renowned architect Steven Holl for the addition to the Nelson-Atkins Museum of Art in Kansas City known as the Bloch Building came out of a design competition opened by the museum in 1999. After six architectural firms presented their designs to the museum committee, the decision to select Holl's design took less than 30 minutes. The addition, consisting of a series of five interlinked glass boxes known as "lenses" opened its doors to the public on June 9, 2007 (Wood, T. & Slegman, A., 2007)—announced by news headlines shown in figure 4.9 above.

The lenses sit on top of a 161,000 square-foot underground building that is 840 ft. long, known as the Bloch Building, named for H&R Block co-founder Henry W. Bloch. This structure, combined with 234,000 square feet in the older building, brought the total size of the museum to around 395,000 square feet. The Bloch building houses the museum's contemporary, African, photography, and special exhibitions galleries as well a new cafe, the museum's reference library, and the Isamu Noguchi Sculpture Court. The addition cost approximately \$95 million and opened to the public on June 9, 2007. It was part of \$200 million in renovations to the museum that included the Ford Learning Center which is home to classes, workshops, and resources for students and educators (Wood, T. & Slegman, A., 2007). The translucent glass facades of the lenses are arranged carefully along



the contours of the site in a dynamic and fluid manner; their layout is as indicated in figure 4.10 below:

**The Nelson-Atkins Museum of Art and its Bloch Building addition in 2007, Kansas City, MO**



**Fig. 4.10:** Site plan of the Nelson-Atkins Museum of Art, Kansas City, depicting the extent of additions. Infographic by author with image from Bahamón & Alvarez (2010).

Holl expresses ideas of transparency and lightness throughout the museum via form and materials, and perpetuates connections with the surroundings by opening up vistas at various levels. The glass lenses shown in figure 4.11 and 4.12 below, provide information about activities and events inside museum, filtering in natural light after blocking out UV rays that are potentially harmful for the art collection. Holl's addition appears to have been well received—deemed successful in balancing function with sensory phenomena, as per



reviews by art and architecture critics in books and the popular press (Bahamón & Alvarez, 2010; Goldberger, 2007; Ouroussoff, 2007). The Bloch Building addition by Steven Holl, due to its architectural attributes as well as the recognition that it has received makes it a prime candidate as a case study for this research.



**Fig. 4.11:** Glass lenses of the Bloch building, Nelson-Atkins Museum of Art, Kansas City, as viewed from across the street, on the eastern edge of the museum site. Image source: author.



**Fig. 4.12:** Glass lenses of the Bloch building, Nelson-Atkins Museum of Art, Kansas City, as viewed from the western side, on the museum campus. Image source: author.

## Case Study 4: Phoenix Art Museum, Phoenix, Arizona

### Phoenix Museum Spreads its Wings

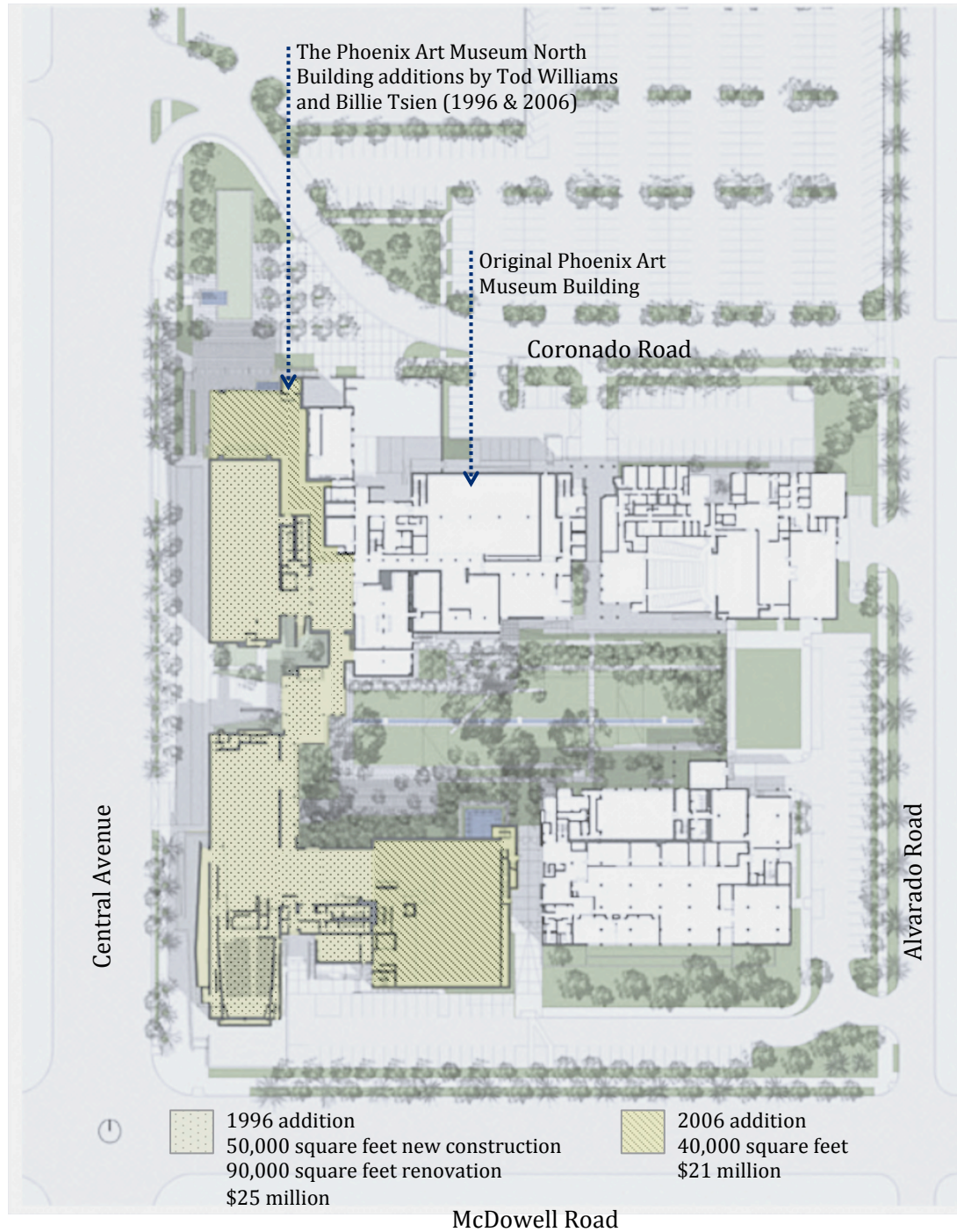
**Fig. 4.13:** News caption in the Art & Antiques Journal announcing plans for a new addition to the Phoenix Art Museum to open in 2006. Image source: Coody (2004), Art & Antiques.

The original Phoenix Art Museum building, which opened in November 1959, was designed by Michigan architect Alden B. Dow and now the museum stands as a complex of different buildings constructed over a period of fifty years. The first museum addition designed by the husband and wife architect duo of Tod Williams and Billie Tsien opened in 1996; it consisted of 50,000 square feet of new construction and 90,000 square feet of renovated museum space, with construction costs totaling approximately \$25 million. William and Tsien were also architects of the American Folk Art Museum in New York that opened in 2001—embroiled in controversy in the year 2013— and discussed in detail in the methodology section.

The continued growth of the city Phoenix motivated the museum board to further expand the campus and Williams and Tsien were once again invited to rethink and strategize the museum site. The second addition that was completed 10 years later in 2006 and announced by the news headline shown in figure 4.13 above, was 40,000 square feet of new construction at a cost of \$21 million, consisting of over 20,000 square feet of column-free gallery space. A new 10,000 square foot, entrance pavilion shaded by a 40-foot cantilever was oriented towards a new entry court and visitor parking. The façade consists of laminated 1-1/2" thick 15-foot high glass panels to create connections with outdoor spaces. Passage to the existing museum occurs through a 26-foot high narrow space. The

layout and extents of the two new museum additions are shown in figure 4.14 below:

**The Phoenix Art Museum, Phoenix, AZ and its two additions in 1996 and 2006**



**Fig. 4.14:** Site plan of the Phoenix Art Museum depicting the extent of additions. Infographic by author with image from Tod Williams and Billie Tsien Architects (twbta.com).



The sculpted ceiling reflects soft light from a clerestory above. The new gallery wing has a 45 feet high skylight that casts changing light onto the ceiling. A sculptural concrete and stone stair with an elevator form the circulation core that connects four levels of galleries. The top floor has a small cantilevered room projecting out from the corner of the museum, allowing carefully controlled daylight into the gallery, providing a view toward the mountains of Phoenix. The total floor area of the Phoenix Art Museum with its two additions (1996 and 2006) is 285,000 square feet. (Coody, 2004; Phoenix Art Museum, n.d.; Tod Williams & Billie Tsien Architects, n.d.).

The new building in the second phase attempts to maintain a relationship with the earlier structure while still declaring a new identity. Exposed pre-cast concrete panels with glass fins are used in both buildings, with green glacier quartz from Utah—which was also used as an aggregate in the first renovation—now used as a smaller aggregate size in a dark concrete mix, in order to compliment the color of the Palo Verde trees that were planted along the street. (Williams, T. & Tsien, B., 2007). A partial view from the west side of the art museum showing parts of both 1996 and 2006 additions is shown in figure 4.15 below.



**Fig. 4.15:** West side of the Phoenix Art Museum showing part of the 1996 and 2006 additions. Image source: author.

## V. METHODOLOGY

### Research limitations

Table 5.1 below summarizes research methods employed in each of the four museums for this study, along with sample sizes for each method:

Case Study	Permission granted by museum Yes/No?	Research methods employed in each museum					
		Employee Survey	Employee Interviews	Content Analysis	Observations	Visitor Counts	Light Measurements
Nelson-Atkins Museum of Art, Kansas City, MO	Yes	● 49 employees (Out of 200, 24.5% response rate)	● 5 employees	● 28 critics' articles	● Back stage: 37 work spaces Front stage: 45 art galleries, 22 non-gallery spaces	● 15 art galleries	● Back stage: 37 work spaces Front stage: 45 art galleries, 22 non-gallery spaces
Phoenix Art Museum, Phoenix, AZ	Yes	● 26 employees (Out of 85, 30.59% response rate)	● 5 employees	● 11 critics' articles	● Back stage: 12 work spaces Front stage: 23 art galleries, 11 non-gallery spaces	● 21 art galleries	● Back stage: 12 work spaces Front stage: 23 art galleries, 11 non-gallery spaces
Met. Museum of Art, New York City, NY	No reply	No	No	● 28 critics' articles	○ No back stage spaces Front stage: 60 art galleries, 9 non-gallery spaces	● 46 art galleries	○ No back stage spaces Front stage: 60 art galleries, 9 non-gallery spaces
Art Institute of Chicago, Chicago, IL	No	No	No	● 33 critics' articles	○ No back stage spaces Front stage: 52 art galleries, 16 non-gallery spaces	● 42 art galleries	○ No back stage spaces Front stage: 52 art galleries, 16 non-gallery spaces
<b>Total</b>	<b>2 Yes, 2 No</b>	<b>75 employees</b> (Out of 285, 26.32% response rate)	<b>10 employees</b>	<b>100 critics' articles</b>	<b>49 work spaces, 180 art galleries, 58 non-gallery spaces</b>	<b>124 art galleries</b>	<b>49 work spaces, 180 art galleries, 58 non-gallery spaces</b>

Note: Non-gallery spaces include lobbies, courtyards, atria, cafes, stores, stairways, hallways, and ramps.

**Table 5.1:** Summary of research methods employed in each museum. Source: author.

Table 5.1 above shows a summary of research methods employed in each museum based on the permissions granted by each institution. All four museums were contacted with a letter via email introducing the study and requesting permission for access to museum spaces and employees. A summary of the research, and backgrounds of the author, committee chair and three other committee members were attached to the letter (see Appendix A). The Metropolitan Museum of Art did not respond to repeated requests (phone calls and emails) to participate in this study. The Art Institute of Chicago responded, but declined to participate. Online surveys of employees at both these institutions, therefore, were not conducted and their back stage spaces were also not studied; employee work spaces were not observed, photographed, or measured for lighting levels. Research at the Met and the Art Institute was restricted to photographing, making on-site observations, visitor counts, and measuring lighting levels in the front stage spaces, , i.e. visitor areas such as art galleries, circulation and gathering areas, museum cafes, and gift shops only.

The Nelson-Atkins Museum of Art and the Phoenix Art Museum on the other hand, responded positively and enthusiastically, giving all the requisite, official permissions for the study. Online surveys and in-person interviews of museum employees were conducted at both these museums, and their front stage and back stage spaces were observed, photographed, and measured for lighting levels.

The process of contacting and corresponding with museum officials at different museums was a learning experience. While the introduction letter and study abstract was crafted carefully in order to create incentive for these museums to participate in the study, smaller museums (Nelson-Atkins and Phoenix Art) took advantage of this opportunity whereas

both larger museums (Met and AIC) did not express interest. Both smaller museums saw the opportunity of getting valuable data (for free) out of this study through collaboration.

## **Method 1: Content analysis of critics' and public reactions to museum additions**

Ada Louis Huxtable; an award winning architectural critic and author, who wrote architecture reviews in *the New York Times* from 1963-1982 and then *the Wall Street Journal* from 1997 until her death (January 7, 2013) was known as the “gold standard” for architectural criticism (Kamin, 2013, p. 12). Paul Goldberger, another award winning architectural critic, author of many books and known as the “leading figure in architecture criticism” (Rao, 2012, p.14), served as architecture critic for *the New York Times*, *the New Yorker* (in which he was known for his popular “Sky Line” column), *Architectural Digest*, and many other leading publications (Goldberger, 2012). Reviews from critics such as these two well-known personalities are very often recognized as a measure of success or failure for new architecture projects (Dunlap, 2013; Newhouse, 2006).

What are critics' opinions about museum addition buildings- when they are proposed and after they are built? How do everyday readers respond to critics' reviews? Do these opinions matter and if they do, then do how they affect the museum's public image or bring about policy changes within these institutions? Everyday readers of newspaper and magazine articles can also be a rich source of information on public perception and opinions via their responses and reactions to published information. A systematic review of critics' articles and public commentary in the popular press was performed via content analysis. The goal of the content analysis method was to identify gaps between critics', ordinary citizens' and practitioners' understanding of the design problem, demonstrating how it can lead to new perspectives and solutions in the designs of museum additions.



### Computer-assisted content analysis of articles:

A content analysis of critics' and reporters' articles on the additions of the Art Institute of Chicago, the Nelson-Atkins Museum of Art, the Phoenix Art Museum, and the Metropolitan Museum of Art, New York was performed using the software- Qualitative Data Analysis (QDA) Miner. A sample of 100 archived articles (n=100) on these four museums' additions before and after each addition was built were selected from big-name, popular newspapers such as the New York Times and Chicago Tribune as well as regional publications such as the Kansas City Star and Southwestern Contractor. These articles included not only the original piece by the author, but also readers' comments expressing reactions to the article, if available. After collecting these articles, they were uploaded to QDA Miner and the program was coded to recognize key words or phrases in text that was be used to identify emerging themes and discussions related to museum expansions. Frequency of these keywords and key phrases were used to identify emerging themes and trends in the survey that shed light on how the museum addition was received by the public and critics. The comparison between two timelines—when it was proposed (before construction) and after it was built were to reveal differences in themes and what they may imply.

Content analysis computer programs such as QDA Miner, however, are merely tools that help one organize and structure text in a manner that makes the analysis process more speedy and efficient; they merely present the information to be analyzed, playing no role in the actual analysis itself (Flick, U., Kardorff, E., & von, S.I., 2004). A trial content analysis, therefore, was performed in order to better understand the specifics of the content analysis and how the results would be analyzed.

Trial content analysis of the MoMA:

A trial case study of a computer-assisted content analysis was performed on two critics' articles on the recent controversial development plans announced by the Museum of Modern Art (popularly known as MoMA) in New York. On April 10, 2013, *the New York Times* (Pogrebin, 2013a) reported the Museum of Modern Art's plans to demolish the adjacent American Folk Arts Museum building in order to build a new expansion. The Folk Arts building built shortly after the 9/11 attacks on New York City, was warmly received by the public as a symbol of hope for the city and it also received positive reviews and publicity for its bold architecture (Pogrebin, 2013). But MoMA officials said that the building's design did not align with their future vision for the museum because its opaque facade did not have MoMA's glass aesthetic and its floors did not line up with the rest of the museum. Pogrebin's report in *the New York Times* included much factual information about the new development, but at the same time, was mostly critical of MoMA's plans. It set the tone for the manner in which the news was to be received with quotes from the director of Columbia University's historic preservation program, Andrew S. Dolkart:

The building is so solid looking on the street, and then it becomes a disposable artifact. It's unusual and it's tragic because it's a notable work of 21st century architecture by noteworthy architects who haven't done that much work in the city, and it's a beautiful work with the look of a handcrafted facade. (p. 2).

In addition, the building's original architects Tod Williams and Billie Tsien also expressed reactions of disappointment.



**Fig. 5.1:** The existing American Folk Art Museum adjacent to the MoMA, New York City. Image source: Pogrebin (2013).

In a short span of two days (April 10 and 11, 2013), this article received 335 comments from online readers, a majority of which were negative reactions to the news, expressing feelings of loss, anger or disappointment. Negative press reviews and public reactions may cause change in many instances; it is interesting to note that after impassioned protests by prominent architects, preservationists, and design critics, MoMA reconsidered its decision to raze the Folk Arts Museum and hired a local architecture firm, Diller Scofidio + Renfro to evaluate the existing Folk Art building and site and propose a new plan- as announced in a subsequent New York Times article by the same critic, Robin Pogrebin on May 9, 2013.

A trial content analysis study on the MoMA controversy was performed by analyzing these two New York Times articles in QDA Miner and coding the text according to emerging themes and issues discussed by critics and readers in these articles. Key words and key phrases were coded into seven categories that were further divided into sub-categories as follows:

**Code categories for content analysis created in QDA Miner**

<b>Architecture</b>	<b>Money</b>	<b>Environment</b>	<b>Culture</b>	<b>Public Sentiment</b>	<b>Collection</b>	<b>MoMA Authorities</b>
Aesthetics, Style and Materials	Construction Cost	Environmental Impact	Urban Image and Identity	Feeling of Loss/Anger/Disappointment	Art Collection and Exhibits	MoMA Director
Space and Layout	Admission Fees/Membership	Real Estate	History and Preservation	Feeling of Happiness/Agreement		MoMA Chairman
Architects	Employment			Neutral/Don't Care		Elitist/Rich/Arrogant
Expansion/Extension/Addition						

**Table 5.2:** Chart showing coding system created for analysis in QDA Miner. Source: author.

**Coding frequency results generated by QDA Miner**

<b>Category</b>	<b>Code</b>	<b>Count</b>	<b>%Codes</b>	<b>Cases</b>
Architecture	Space and Layout	46	5.00%	2
Architecture	Expansion/Extension/Addition	11	1.40%	2
Architecture	Architects	62	7.70%	2
Architecture	Aesthetics, Style and Materials	83	10.40%	2
Collection	Art Collection and Exhibits	74	9.20%	2
Culture	Urban Image and Identity	28	3.50%	2
Culture	History and Preservation	31	3.90%	2
Environment	Real Estate	18	2.20%	2
Environment	Environmental Impact	23	2.90%	2
MoMA Authorities	MoMA Director	8	1.00%	2
MoMA Authorities	MoMA Chairman	6	0.70%	1
MoMA Authorities	Elitist/Rich/Arrogant	40	5.00%	1
Money	Employment	5	0.60%	2
Money	Construction Cost	43	5.40%	2
Money	Admission Fees/Membership	22	2.70%	1
Public Sentiment	Neutral/Don't care	17	2.10%	1
Public Sentiment	Feeling of Loss/Anger/Disappointment	235	29.30%	2
Public Sentiment	Feeling of Happiness/Agreement	49	6.10%	1

**Table 5.3:** Coding frequency results. Source: author.

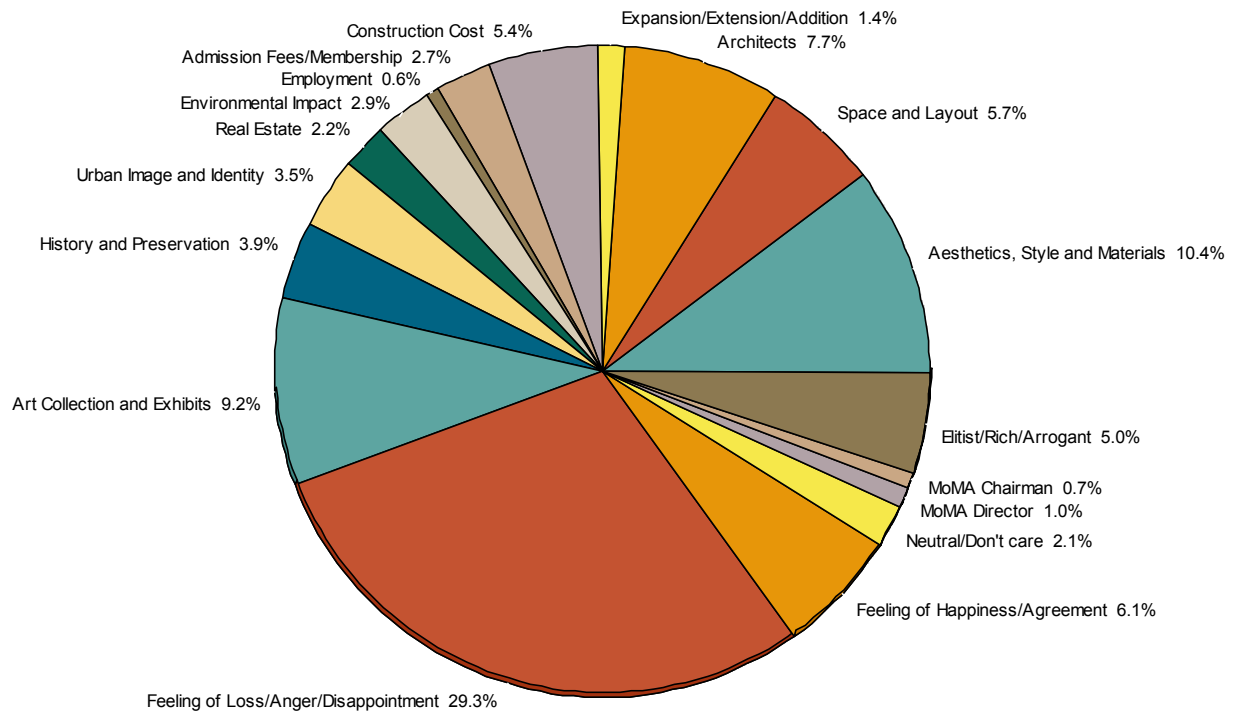
The coding frequency results from the content analysis seen in Fig. 5 show the frequency of key words, key phrases, and sentences under the selected themes used for coding (shown under ‘category’ and ‘code’) for the two selected cases (New York Times articles). The frequencies indicate that an overwhelming majority of readers’ reactions—235—were negative (“MoMA should be ashamed of themselves”, “This is an example of the arrogance of rich institutions”, “Who cares if MoMA wants more glass? Don’t we have enough of that in Manhattan?”), 49 were positive (“I personally never liked the (Folk Art) building”, “That building always seemed awkward to me. Not surprised it’s going”, “It was a real miss architecturally and always made me think of a Kleenex box standing on the end. No big loss here.”), and 17 were neutral (“As for arguing for or against keeping it, respectfully, due to my lack of residency I’m not really qualified to join that debate”).

After completing the coding, the frequency of key words and key phrases under emergent themes was used to generate the graphics shown in figures 5.2 and 5.3 below:



**Fig. 5.2:** Word cloud of content analysis. Source: author.

### Distribution of keywords (Frequency)



**Fig. 5.3:** Pie chart of content analysis. Source: author.

The word cloud in figure 5.2 and pie chart in figure 5.3 indicate that feelings of loss, anger, and disappointment towards MoMA's decision of razing the American Folk Art Museum were the dominant themes while feelings of happiness or agreement, and neutral stances on the issue were very few. The comments and discussions by the reporter, experts quoted in the article, and readers also highlighted a range of other concerns. For example, 10.4% of the discussions were about aesthetics, style, and materials; essentially a reaction to MoMA's desire to continue their glass façade aesthetic on the exterior of the entire museum. Many readers also praised the sculptural bronze façade of the existing Folk Art building while few were critical of its architecture. It is also interesting to note that

references to MoMA's director and chairman were very few (1.7%) compared to references towards architects (7.7%), most of them consisting of expressions of sympathy with Tod Williams and Billie Tsien—the American Folk Museum's architects, while some were criticisms directed towards Yoshio Taniguchi—the architect of MoMA's renovation in 2004 and its "glass aesthetic", that many readers felt rendered it as a "shopping mall". 5.7% of key words and phrases fell in the category of "space and layout", most of which were negative reactions towards MoMA's need to demolish the Folk Museum because the floor plates did not align at present. 3.9% of the coding frequency expressed the importance of history and preservation almost as much as the importance of urban image and identity (3.7%), followed by concerns regarding the environmental impact of the planned construction (2.9%) and the politics of real estate in New York (2.2%). Some thought that MoMA's decision reflected its elitist/arrogant character as a 'rich' institution (5%) with its plans of spending millions of dollars in construction costs (5.4%) with many readers complaining of its already exorbitant admission fees and membership charges (2.7%); some of them worrying that they would now be hiked even more ("I guess MoMA could charge \$35. To help pay for seamless floor plates."). There were many references towards art collections and exhibitions (9.2%)—either the MoMA's or the Folk Art Museum's—showing the public concern for art as much as architecture and real estate ("The Museum of Modern Art destroying a work of Modern Art?.", "The interior (of the Folk Art Museum) was not conducive to displaying the folk art collection.", "It was a perfect space for that folk art collection. Such a lovely space, such a lovely collection.").

It is difficult to draw significant conclusions from a trial case study performed only on two articles (even though they generated almost 400 comments from readers), however, it

provides us with an example of how a content analysis articles and reviews can be used as a useful source of data to highlight important themes and topics of discussion surrounding museum additions and expansions.

The qualitative content analysis method employed in this study was an extensive, in-depth analysis of 100 articles on the additions of the Art Institute of Chicago, the Nelson-Atkins Museum of Art, Kansas City, the Phoenix Art Museum, and the Metropolitan Museum of Art, New York. Its goal was to highlight the significance of critics' opinions and reports of museum developments on peoples' voices and perceptions of what a museum addition is or what it will be. In the case of MoMA's future development plans, the new expansion already appeared to have been rejected by a majority of the audience. The case study of the MoMA showed that ordinary museum-goers, residents, and visitors from other parts of the country or the world, considered the museum to be a major cultural landmark of the city, embedded with personal memories and meanings formed from their visits. MoMA, according to many critics, visitors, and local residents, symbolized New York. Its decisions, therefore, affected the image and perception of the city.

Public opinion and commentary also indicates that people are well informed about museum developments, art collections, and exhibits and they have opinions on museum aesthetics, architecture, and design via popular media, even if they are not design professionals or museum experts.



## **Method 2: Questionnaire survey of museum employees**

All four museums were contacted to participate in this study which included an online survey of museum employees. The Met, however, did not respond to the request and Art Institute of Chicago declined to participate. The Nelson-Atkins Museum of Art and the Phoenix Art Museum agreed to participate in the study and an online employee survey was conducted at both these museums as the first step of the post-occupancy evaluation of museum additions. The objectives of this survey were: 1) To find out if any significant differences exist in museum employees' perceptions of museum spaces before and after the museum addition has been built, and if they exist, then what they are, 2) To examine museum employees' perception of their current work space attributes, find out if these work spaces measured up to their expectations, 3) To determine whether the museum additions have contributed to any change — for the better or worse — in their work environments, and 4) To determine if any environmental attributes have an impact on their satisfaction with their work environments, and if so, then how much. The questionnaire focused on one of these attributes— lighting—in the form of both daylight and electrical light — in most detail. The term “work space” included any space in the museum where employees spend most part of their working day- for example, an education space for an instructor, an art gallery in case of a museum security guard or an office or conservation lab in the case of a curator and conservator. The questions on lighting gave valuable insight into employees' perceptions and satisfaction in addition to actual physical measurements of illuminance in their work spaces (described in detail in the next section).

Previous studies have shown that workers' mood, satisfaction, and perceptions of lighting can be quite different from what actual illuminance measurements and standards tell us (Boubekri, 2004; Boubekri, Hull & Boyer, 1991; Leather et al.; 1998). Post-occupancy evaluation studies of office workers have revealed that even if lighting parameters meet the standards, very often, a substantial proportion of employees remain dissatisfied. Office workers, as per these POE studies, are strongly influenced by their workstations' proximity to windows and the amount of sunlight penetration (Boubekri, 1995; Boubekri & Haghighat, 1993). In fact, sunlight penetration affects the occupant emotional state and degree of satisfaction, while window size does not. These studies suggest that sunlight penetration can be used to promote, facilitate, or hinder certain activities that are desirable in office settings (Boubekri, Hull & Boyer, 1991). Questions to employees on daylighting in their work spaces, therefore, formed an important part of this survey.

The questionnaire designed for this survey (attached in Appendix B) received UIUC Campus Institutional Review Board approval (IRB) with an exempt status (attached in Appendix D); this research was approved as having no more than minimal risk and it involved survey procedures, interview procedures, or observations in which human subjects could not be identified (IRB UIUC).

A majority of the questions in the questionnaire have been formatted using a Likert Attitude Scale (Zeisel, 2006). Keeping in line with this format, groups of related statements or questions were presented to respondents for them to indicate their intensity of agreement or disagreement. The levels of agreement and disagreement were assigned scores indicating respondents' positions on items (Zeisel, 2006). Having respondents'

scores as opposed to only “Yes” or “No” responses were found to be useful since they created quantitative data that could be analyzed with the help of graphs and statistics.

This questionnaire was designed in the computer program “Qualtrics” for distributing and collecting responses via the internet. The museum director’s offices were contacted for the necessary permissions to interview museum staff. The museum staff, after they agreed to participate, were offered a choice of forwarding the online survey themselves or providing email addresses of employees so that it can be distributed directly. Both the Nelson-Atkins and the Phoenix Art Museum elected to distribute the survey to their employees themselves. Any identifying information for employees was not collected in the survey in accordance with IRB guidelines, and the fact that the museums distributed the survey themselves also provided the employees an additional level of anonymity. A complete questionnaire survey format has been attached in Appendix B.

#### Selection Criteria:

The survey was sent to a cross-section of museum employees so as to get an accurate representation of the museum workforce and increase the external validity of the study (Webb, 2000). The intent was to get feedback from any museum employee — a director, curator, or security guard — who agreed to participate in the study. The sample selection, however, was influenced by the Nelson-Atkins and Phoenix Art Museum representatives who were the main points of contact for this research. They forwarded the survey link with an introduction to employees in their museums: 200 museum employees of the Nelson-Atkins and 85 employees of the Phoenix Art Museum, a potential sample size of 285 museum employees. The survey response rate will be discussed in the Results section.

The timeframe during which the subjects were employed — before, during or after the museum addition was built — was not a selection criterion for survey participants. The final objective was to group all the responses together in order to study them as a sample that was representative of a typical museum workforce.

Analysis of questionnaire responses:

A textual analysis of all participant responses was performed in order to bring out emergent themes, categories, and concerns about museum additions. The survey results were sorted in the computer program, Microsoft Excel. Both textual and numerical responses were sorted to search for key words or phrases in the responses and generate statistical charts. The goal of this analysis was to reveal what mattered to employees and how much—when it came to museum expansion projects — whether it was the quality of the overall architecture, space and layout, the display of objects and art, visitors feedback, or their satisfaction with their work environments.

Descriptive statistics which included measures of central tendency—such as mean of the sample responses were used to analyze variables such as employees' overall satisfaction with their work spaces, satisfaction with lighting in work spaces, and their opinion of the new museum addition. The results of each variable were graphically represented via histograms or pie-charts or both.

Part of the questionnaire was directed towards getting indirect feedback from museum visitors — through comments that they had given museum employees such as gallery docents, curators, and security guards over the years; what they thought about the museum addition and how it affected their experience of art. The data, therefore, was

collected directly and indirectly from two principal museum occupant groups: museum employees and museum visitors respectively.

### **Method 3: On-site interviews of museum employees**

Selected personnel at the Nelson-Atkins Museum and the Phoenix Art Museum were also interviewed in person and on-site. The goal was obtain feedback from a wide range of employees—from a director to a security guard, and this formed the main selection criteria for interviewees. An effort was also made to interview individuals of similar levels of responsibility at both museums, however, there were some variations due to differing administration and staff structures at both museums, and the consent or availability of individuals for the interview at the time of the field visit.

A total of ten employees were interviewed in both museums, five at the Nelson-Atkins Museum of Art and five at the Phoenix Art Museum. At the Nelson-Atkins Museum, the Director of Administration and Visitor Services, the Director of presentation (who played the role of exhibition/lighting designer), Curator of Architecture and Design, a Gallery Docent (volunteer), and a Security and Visitor Services Officer were interviewed. At the Phoenix Arts Museum, a Visitor Services employee, the Curator of American and Western-American Art, an Exhibition Designer, a Gallery Docent (volunteer), and a Security Manager were interviewed. In addition to these interviews, some informal conversations were held with security guards and volunteers in all four museums, who approached the author on their own and voluntarily raised concerns about the museum. The complete questionnaire format for each employee type is attached in Appendix C.

#### **Method 4: Unobtrusive observations**

All four museums and their additions were observed on-site in an unobtrusive manner.

Field visits were made to each museum from March through August 2014. The intent was to visit each museum for a minimum of each day of the week that it was open to the public, which varied from five to seven days of the week depending on the museum, but the actual field visits took at least seven to ten days, approximately six hours per day in each museum. Observation notes were made on the aesthetics of each space with special focus on lighting, wayfinding, circulation, and connectivity issues throughout the old and new parts of the buildings. The type of exhibition on display at the time of observation and the type of visitor activity that it involved (seeing, touching, interactive controls, lying down, etc.) were also documented.

Selection criteria for art galleries:

Observations were conducted in a total of 180 art galleries in all four museums; 60 in the Met, 52 in the Art Institute, 45 in the Nelson-Atkins, and 23 in the Phoenix Art Museum as shown in table 5.1 earlier. The objective for this study was to ensure that the sample of observed galleries included each type of art gallery on every floor of each wing of the museum building. Art galleries in all four museums were organized as per curatorial departments. In each museum wing, therefore, at least two galleries of each art type within each curatorial section and on each floor were selected for observation. For example, in the Metropolitan Museum of Art, two galleries of American art were observed on the first floor and two were observed on the second floor in the American Wing, and so on. The same set

of galleries were used to take lighting measurements (described next), in order to maintain uniformity between samples (galleries) selected for measurements and observations.



## **Method 5: Lighting measurements in front stage and back stage spaces**

The questionnaire survey was designed to reveal employee's perceptions and experiences of lighting in their workspace, however, actual physical measurements of lighting in the Nelson-Atkins Museum of Art and Phoenix Art Museum were necessary to see if they met industry standards and code requirements, and compare them with survey responses.

Lighting designers and consultants plan lighting levels in the projects using industry standards defined by organizations such the Illuminating Engineering Society of North America (IESNA, 1996,), and very often, they do not consider occupants' perceptions of comfort and satisfaction which may be quite different from prescribed standards in design guides and code books (Boubekri, 2004; Leather et al, 1998). What are the actual lighting levels in a particular museum environment? How do these compare to occupants' perceptions and experiences of lighting in that environment? Using a combination of occupant responses from the survey and physical measurements of lighting, therefore, was necessary to further the understanding of lighting as an environmental attribute in museum workspaces.

Illuminance measurements that included both electrical light and daylight were made in museum employees' offices and work areas in the Nelson-Atkins and Phoenix Art Museum. A total of 49 work spaces were measured, 38 in the Nelson-Atkins and 11 in the Phoenix Art Museum. These measurements were made with an iPhone fitted with a lens and an application called "Luximeter". In order to reduce errors, measurements were taken at two different points on each workstation plane. Illuminance was measured in lux (lumens per sq. ft.) This average of these two readings was used as the illuminance level for that work

space. All measurements were made between 10 am and 1 pm, on partly overcast days, in order to keep the daylighting levels as consistent as possible. All measurements were made from March through August 2014—the time period during which field visits were made.

In the front stage, public parts of the museum, illuminance measurements were taken in 58 non-gallery spaces which included common gathering and circulation areas such as courtyards, atria, hallways, corridors, ramps, and staircases, and the same 180 art galleries for which the selection criteria was described in detail earlier, across all four museums as shown in table 5.1.

### **Analysis of illuminance measurements**

Comparison to industry standards:

Lighting levels in front and back spaces museums are crucial for art conservation over the long term. At the same time, they need to be suitable for the appreciation and viewing of art on display, meeting accessibility requirements, and for a variety of functional tasks to be carried out by the museum workforce (Cuttle, 2000). Illuminance measurements taken in front and back spaces were compared to the recommended industry lighting levels set by IESNA for general office areas (2014), museums and art galleries (IESNA, 1996) and required levels for accessibility set by both ADA (2010) and IESNA (1996). Both ADA and IESNA set the same levels for accessible ambient lighting, but IESNA goes into more detail for museums with additional categories such as accessible levels for looking at specimens and objects, reading text panels, and directional signage, therefore, this standard along with ADA, was adopted for this study.

Statistical tests:

The responses received from the survey questions related to employees' perceptions and the illuminance measurements taken at museum employees' work spaces were analyzed together using statistical correlations to check for any potential associations between 1) illuminance levels in museum employees' work spaces and their overall satisfaction of their workspaces, and 2) illuminance levels in museum employees' work spaces and their satisfaction with lighting levels in these spaces.

Objective of the statistical analysis:

The success of a museum addition needs be measured not only in its front stage areas such as galleries and circulation spaces, but also in its backstage areas where museum employees spend most of their time — educational facilities, staff offices , meeting rooms, work rooms, etc. The results of statistical analysis provided valuable insight into the relationships between museum employees' perceptions of the museum addition, their satisfaction with their work space and one of the environmental attributes of their work space — lighting, which is considered to be one of the most important in addition to indoor air quality, privacy, windows, and views (Boubekri et al, 1991; Leather et al, 1998; Stone, 1998). They would tell us, first of all, if any such relationship existed, and if it did, then to what extent it was significant.

## **Method 6: Visitor counts, space syntactic typologies, and on-site observations**

The goal of space syntax analysis via visitor counts, space syntactic typology, and on-site observations, was to enhance curatorial intent, architectural intent, and visitor experience in museums receiving new additions. The results of the space syntax analysis were to be used to formulate evidence-based design guidelines for spatial configurations that would assist museum decision-makers, design professionals, and other stakeholders in designing museum expansion layouts.

As museums expand, the contribution of the new architectural space towards patterns of use by visitors and framing their experience needs to be studied in detail: space has the capacity to accommodate knowledge, identity and culture. Therefore, architecture has the responsibility of providing structure and context to objects in order to fulfill the task of shaping our collective memory (Psarra, 2005). While curatorial intent has received much attention in museological studies, architectural intent has not—in spite of a growing realization that spatial design can make a significant difference to the museum experience (Hillier & Tzortzi, 2011). Poor design is one of the many factors that contribute towards the visitor phenomenon of “museum fatigue”, which has serious consequences for the visitor experience – tiredness, exhaustion, and boredom to name a few (Bitgood, 2009).

Architectural intentions for new designs need to be compared with the actual way in which the museum works with the structure of spaces and the actual routes taken by users. Museum additions in this respect provide museum management and designers with a new opportunity to fix problems and provide new solutions.

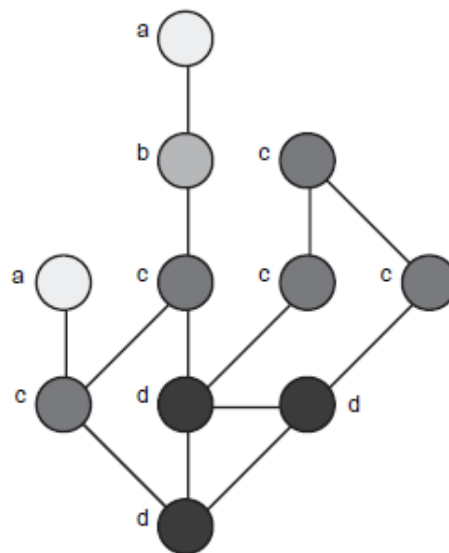
How does spatial logic, layout, and connectivity in museum additions affect the way spaces in the museum addition — existing or planned — are used or will be used by museum visitors? Does layout of the existing space make a difference, and if so, then what kind of difference? Are the sequence and arrangement of spaces conducive to an optimal visitor experience?

These questions were to be answered by a combination of space syntax plan analysis and unobtrusive physical on-site observations. Space syntax combines topological and quantitative analysis of two-dimensional plans in order to quantify physical attributes of the environment (Zeisel, 2006). It is a set of descriptive, quantitative, and analytical tools for analyzing the spatial layout in buildings (Hillier 1996; Hillier & Hanson 1984). Space syntax is based in two philosophical ideas: the first is that space is not just a background for human activities but an intrinsic aspect of it. The second is that a space is not just a function of its own properties, but of its relation to all the other spaces that make up a layout. In this way, it considers the fact that space generates social patterns which in turn show how buildings in themselves can be seen as spatial expressions of culture (Hillier & Tzortzi, 2011).

#### Principles of Space Syntax:

In space syntax analysis, axial, convex, and isovist maps are three fundamental ways used to break a two-dimensional plan into constituent elements in order to represent the organization of a space in a visual manner. People are considered to move through space in lines known as axes, interact with other people in convex spaces, and experience space as a series of visual fields known as isovists. Accordingly, axial maps show lines mapping

peoples' movements in the floor plan, convex maps show spaces in floor plans where people interact—any occupiable voids in the plan usually shown as polygons, and isovist maps show lines representing unobstructed visual fields from any given point in the floor plan. Depth and embeddedness are two syntactic principles: depth identifies how many other spaces must be passed through to reach a destination or return to a starting point, while embeddedness measures the movement potential of spaces. An *a-space* is a dead-end occupation space with no movement potential, a *b-space* has more than one connection but lies on the way to a dead end, a *c-space* is 2-connected and on at least one ring so that we have one alternate return route, and a *d-space* is 3+-connected and on at least two rings, making it a movement space and tending to be a local focus for movement. (Bafna, 2003; Hillier & Tzortzi, 2011).



**Fig. 5.4:** The abcd typology of spaces according to their embedding in the layout by Bill Hillier and Kali Tzortzi. Image Source: Macdonald, S. (Ed.), *A Companion to Museum Studies*, p. 296.

The space type, or embeddedness, is helpful in understanding functioning of museum layouts. A single ring of spaces is one where every visitor is made to go through the same

sequence in the same order which maximizes control and has little social potential. A grid, on the other hand, is one in which every space connects to all its neighbors. It is complex in form, difficult to understand and visit in an orderly sequence, but it also minimizes control placed on the visitor, and facilitates new experiences and encounters. Most museum layouts consist of *c*-, or sequence, spaces and *d*-, or choice, spaces. The ratio between these *c* and *d* spaces, and their configuration, critically affect the visitor experience. (Bafna, 2003; Hillier & Hanson, 1984; Hillier & Tzortzi, 2011).

Maps generated by space syntax—convex, axial, and isovist—indicate *connectivity*: a local measure of the direct connections from a space, and connectivity can be extended to the quantitative measures of integration or segregation. Integration describes a space as a pattern of global connections based on depth. The higher the integration value of a space, the more directly connected it is to other parts of the system; the lower the value, the more segregated and indirect. We can also quantify the intelligibility of a layout by the degree to which the pattern of connectivity of all spaces in a system correlates with the pattern of integration values (Bafna, 2003; Hillier & Hanson 1984; Hillier & Tzortzi, 2011).

How Space Syntax was used:

A syntactic study to examine the integration of spaces — galleries, and gathering spaces such as cafes, restaurants, and atria — was to be applied exclusively to museum addition buildings in order to assess their impact on the existing museum building, and how effectively the spaces — both old and new — are integrated into the reconfigured building as a whole. Its goal was to help in determining how the new museum spaces are integrated

into the building compared to the older ones and how this directly affects occupancy rates for these spaces.

Previous studies have employed space syntax analysis via computer modeling techniques together with physical on-site observations to develop models of behavior correlated with the characteristics of plans. These correlations were used to analyze and predict use patterns of existing spaces and future development schemes in museums; a technique that has proven to be effective in previous museological research (Psarra, 2005; Zeisel, 2006). Psarra (2005) traced the impact of architecture on two contemporary and two historical museums in Britain using a computer-generated analysis of layout and observing patterns of visitor movement. Hillier and Tzortzi (2011) used space syntax to show how the sequencing of spaces in certain museum and gallery layouts impacted the potential for encounters amongst visitors which in turn affected the degree of their social experience.

A study of these precedents revealed that space syntax was a powerful tool not only for making inquiries, exploring alternative layouts, and making strategic choices, but also for getting a better handle on the effect of space on our cognitive and social experience of museum and gallery layouts.

For the purposes of this research, however, linear correlations were not found to be useful since many factors were found to affect visitation to certain art galleries, in both larger museums (Met and AIC) and smaller ones (Nelson-Atkins and Phoenix Art). For example, in the Metropolitan Museum of Art, exhibitions that were featured on the “Now on View” brochure were to be well-visited since visitors located these exhibitions on the map and made a special effort to visit them during their visit. The Art Institute is famous for its



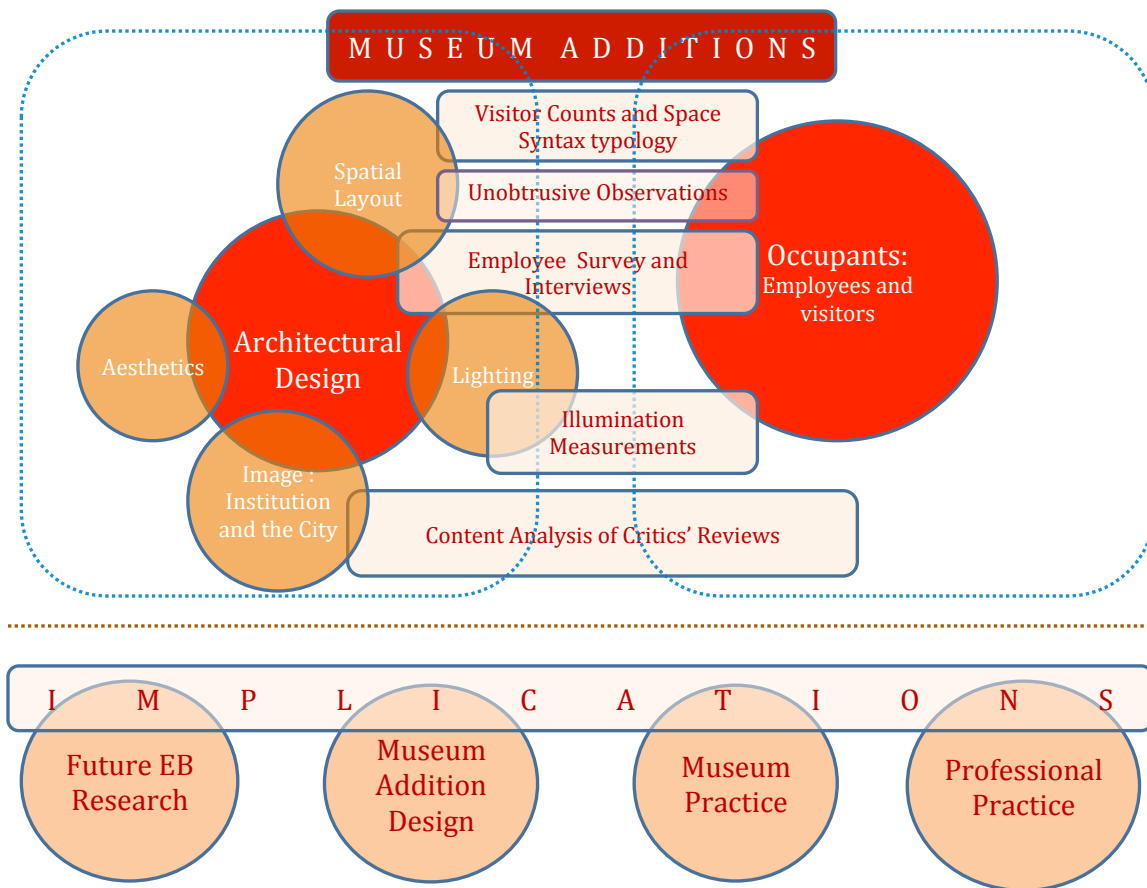
Impressionist art collection, therefore, the second floor Impressionist galleries were always well-visited. Instead of linear correlations, therefore, assigning galleries with the syntactic typology of a-b-c-d to analyze its location and access route in the museum plan, and discussing its typological relationship with the rate of visitation and the various other factors that influenced it was found to be more useful.

Visitor counts were recorded in total of 124 selected art galleries in all four museums, 46 in the Met, 42 in the Art Institute, 15 in the Nelson-Atkins, and 21 in the Phoenix Art Museum as shown in table 5.1. The number of visitors were recorded for ten minutes per gallery, only on Saturdays and Sundays from 10:30 am to 5 pm, with the exception of the Phoenix Art Museum which on Sundays, was open only from 12 pm to 5 pm. These visits were planned with the assumption visitor attendance in museums would be typically more on weekends; an assumption which was supported by precedent studies discussed as well as advice given by employees who were interviewed. Any other specific observations regarding visitors' movement patterns were also carefully recorded.

Analysis of visitor counts and space syntactic typology:

Assigning the syntactic typology of galleries combined with observations revealed whether any relationship between the spatial layout of the museum addition and the rate of visitation existed. The space syntax analysis exercise pointed out deficiencies in the existing spatial layout and discussed how it could be configured for a better visitor flow and an overall better museum experience in future museum additions or renovation projects.

## Summary of research design



**Fig. 5.5:** Research Design with methodology and expected implications

The diagram in figure 5.5 above summarizes the research design of this study, with the its expected implications added below. As per the data collected by the AAM, museums are considered to be key educational environments for children and adults in the United States. If museums wish to continue to be places of learning, and significant and positive forces in the lives of people, it is only logical that they should be accountable to their users. *This study moves the spotlight away from the usual debates on architectural forms and blockbuster exhibitions, and focuses it on museum occupants instead.* By touching on key

issues affecting perceptions and experiences of museum employees and visitors, the six methods aim to bridge the gap between occupants and architectural design while illuminating the myriad ways in which museum additions have been conceived so far.

The architect and user both produce architecture, the former by design, the latter, by use. As architecture is experienced, it is made by the user as much as the architect. Neither are the two terms mutually exclusive. They exist within each other. Just as the architect is also a user, the user can be an illegal architect. (Hill, 1998, p. 6).

With in-depth case studies of the Metropolitan Museum of Art, Art Institute of Chicago, Nelson-Atkins Museum of Art, and the Phoenix Art Museum, this study aimed to expose a number of successes and shortcomings of these buildings from an insider's point of view.

In an age where 'starchitects' design buildings from squiggles drawn on cocktail napkins, an urgent need for evidence-based design that takes into account visitors' needs and the experience of viewing art exists, and in order for this to happen, concrete, in-depth studies of human factors in relation to design are necessary.

As depicted in the graphic, the results of this study were expected to have important implications for museum addition design, museum practice, and professional practice in the design industry. They were expected to reveal potential for future environmental behavior research studies in museum environments—research that leads to design implications that are evidence-based and human-centric.

## VI. RESULTS AND DISCUSSION

The matrix provided in Methodology summarizing research methods employed along with samples sizes in each of the four museums, is shown here again for reference (table 6.1), before discussing the results from each method in detail:

Case Study	Permission granted by museum Yes/No?	Research methods employed in each museum					
		Employee Survey	Employee Interviews	Content Analysis	Observations	Visitor Counts	Light Measurements
Nelson-Atkins Museum of Art, Kansas City, MO	Yes	● 49 employees (Out of 200, 24.5% response rate)	● 5 employees	● 28 critics' articles	● Back stage: 37 work spaces Front stage: 45 art galleries, 22 non-gallery spaces	● 15 art galleries	● Back stage: 37 work spaces Front stage: 45 art galleries, 22 non-gallery spaces
Phoenix Art Museum, Phoenix, AZ	Yes	● 26 employees (Out of 85, 30.59% response rate)	● 5 employees	● 11 critics' articles	● Back stage: 12 work spaces Front stage: 23 art galleries, 11 non-gallery spaces	● 21 art galleries	● Back stage: 12 work spaces Front stage: 23 art galleries, 11 non-gallery spaces
Met. Museum of Art, New York City, NY	No reply	No	No	● 28 critics' articles	○ No back stage spaces Front stage: 60 art galleries, 9 non-gallery spaces	● 46 art galleries	○ No back stage spaces Front stage: 60 art galleries, 9 non-gallery spaces
Art Institute of Chicago, Chicago, IL	No	No	No	● 33 critics' articles	○ No back stage spaces Front stage: 52 art galleries, 16 non-gallery spaces	● 42 art galleries	○ No back stage spaces Front stage: 52 art galleries, 16 non-gallery spaces
<b>Total</b>	<b>2 Yes, 2 No</b>	<b>75 employees</b> (Out of 285, 26.32% response rate)	<b>10 employees</b>	<b>100 critics' articles</b>	<b>49 work spaces, 180 art galleries, 58 non-gallery spaces</b>	<b>124 art galleries</b>	<b>49 work spaces, 180 art galleries, 58 non-gallery spaces</b>

Note: Non-gallery spaces include lobbies, courtyards, atria, cafes, stores, stairways, hallways, and ramps.

**Table 6.1:** Summary of research methods employed in each museum. Source: author.

## **Part 1: Museum additions in the media: Content analysis results**

What are art and architecture critics' reactions to museum additions in the popular press? What issues are the most discussed and what are the least? A computer assisted content analysis using the program QDA Miner was performed on articles in the popular press (newspapers and magazines) in order to analyze critics' opinions on the selected museum additions, and the frequency of various themes and trends emerging from these discussions.

Three popular media databases accessed through a University of Illinois library were found to contain a mix of well-known national newspapers such as the New York Times, the Chicago Tribune, and the Wall Street Journal as well as smaller, local publications such as the New York Sun, Southwest Contractor (Phoenix, Arizona), and Kansas City Business Journal (Kansas City, Missouri). These three databases were used to collect articles on additions to all four museums in order to keep the source of data collection uniform across all case studies. A complete list of article references, sorted as per museum, database, and search terms used, are provided in Appendix E: Content Analysis Database.

Initially, an effort was made to analyze the same number of articles (which will also be referred to as "cases") for each museum, however, there was found to be some variation in the amount of media coverage that each museum addition had received depending upon factors such as the popularity and reputation of the museum, its art collection, its location and the reputation of the various stakeholders and decision-makers involved in planning the addition—the museum director, the board of trustees, major donors and benefactors, the architect of the addition, etc. From the 100 cases analyzed, 28 were on the additions of

the Met, 33 on the additions of the Art Institute of Chicago, 28 on the Nelson-Atkins, and 11 on the Phoenix Art Museum additions—which were found to be the least reported in the popular media, as compared to the other additions. All 100 cases were combined as a single project in the program QDA Miner and a textual analysis for content was performed after coding the project into different categories. These categories and codes were created on the basis of recurring themes and topics that were most commonly covered and discussed in all the selected cases.

Table 6.2 below shows how the coding format was divided. There were eight principal categories—1) Architecture, 2) Money, 3) Art, 4) Critics’ Reactions, 5) Environment and Surroundings, 6) Decision-Makers, 7) Education, and 8) Occupants that were further subdivided into codes as shown in table 6.1 below. The table also indicates the resulting counts of keywords, expressions, and/or sentences that represented a particular code under a particular category across the entire sample and the number and percentage of the cases that contained that particular code and category.

What was the most discussed theme and what was the least? “Style, aesthetics, and materials” of the addition under the category of “Architecture” constituting 17.4% of the coding frequency and discussed in 94.4% of cases, was the most frequently repeated theme, while “Admission Fees/Membership Cost” under “Money” and “Neutral” under “Critics’ Reactions” were the least repeated, constituting 0.1% of the coding frequency and discussed only in 2.2% of cases. A breakdown of code frequencies and number of cases with percentages of both under categories, sorted by reducing number of code counts are also shown in table 6.2 below.

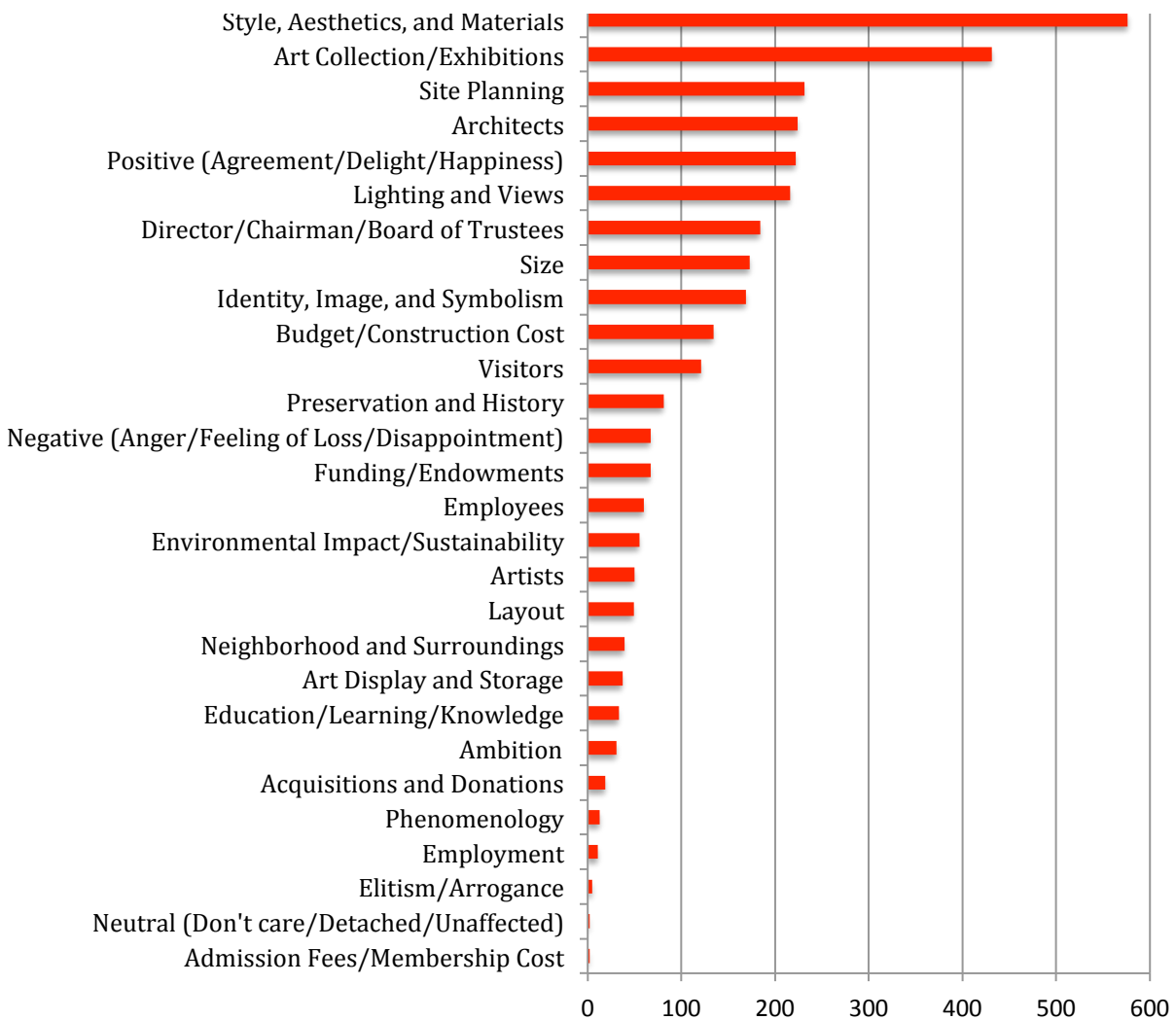
**Coding and case frequency results sorted by reducing number of code counts**

Category	Code	Count	% Codes	Cases	% Cases
ARCHITECTURE	Style, Aesthetics, and Materials	576	17.30%	85	94.40%
ART	Art Collection/Exhibitions	431	12.90%	88	97.80%
ARCHITECTURE	Site Planning	231	6.90%	76	84.40%
DECISION-MAKERS	Architects	224	6.70%	73	81.10%
CRITICS' REACTIONS	Positive (Agreement/Delight/Happi-ness)	222	6.70%	64	71.10%
ARCHITECTURE	Lighting and Views	216	6.50%	62	68.90%
DECISION-MAKERS	Director/Chairman/Board of Trustees	184	5.50%	60	66.70%
ARCHITECTURE	Size	173	5.20%	73	81.10%
ARCHITECTURE	Identity, Image, and Symbolism	169	5.10%	69	76.70%
MONEY	Budget/Construction Cost	134	4.00%	64	71.10%
OCCUPANTS	Visitors	121	3.60%	64	71.10%
ARCHITECTURE	Preservation and History	81	2.40%	50	55.60%
MONEY	Funding/Endowments	67	2.00%	28	31.10%
CRITICS' REACTIONS	Negative (Anger/Feeling of Loss/Disappointment)	67	2.00%	35	38.90%
OCCUPANTS	Employees	60	1.80%	39	43.30%
ENVIRONMENT AND SURROUNDINGS	Environmental Impact/Sustainability	55	1.70%	34	37.80%
ART	Artists	50	1.50%	34	37.80%
ARCHITECTURE	Layout	49	1.50%	33	36.70%
ENVIRONMENT AND SURROUNDINGS	Neighborhood and Surroundings	39	1.20%	34	37.80%
ART	Art Display and Storage	37	1.10%	29	32.20%
EDUCATION	Education/Learning/Knowledge	33	1.00%	25	27.80%
DECISION-MAKERS	Ambition	31	0.90%	24	26.70%
ART	Acquisitions and Donations	19	0.60%	14	15.60%
ARCHITECTURE	Phenomenology	13	0.40%	9	10.00%
MONEY	Employment	11	0.30%	8	8.90%
DECISION-MAKERS	Elitism/Arrogance	5	0.20%	4	4.40%
MONEY	Admission Fees/Membership Cost	2	0.10%	2	2.20%
CRITICS' REACTIONS	Neutral (Don't care/Detached/Unaffected)	2	0.10%	2	2.20%

**Table 6.2:** Coding format, coding and case frequency results sorted by reducing number of code counts.  
Source: author.

The horizontal bar chart in figure 6.1 below is a graphic representation of coding frequency results shown in table 6.2 above.

### Coding frequency results from content analysis of critics' opinions of all four museums



**Fig. 6.1:** Coding frequency results from content analysis. Source: author.

We see, once again, how the conversation on the style, aesthetics, and building materials (glass, steel, concrete) or finishes (colors, stone, ceilings, carpets) under “Architecture” had a clear lead on other categories for its coding frequency. Here are two excerpts from discussions that were found to fit under this category:

The design [of the American Wing at the Met] is modern but not sterile, with either cove or vaulted ceilings and some skylighted spaces. Inspired by 19th-century



Beaux-Arts proportions, the walls have simplified Classical cornices and dados, creating a sense of the grand, domestic proportions that were the original backdrop for many of these canvases decades ago. (Vogel, 2012, pp. 1-2).

Each picture (in the American Wing at the Met) takes its proper place against well-lighted walls painted a uniform soft cream-beige, in defiance of a current trend for richly colored backgrounds. Everything has a freshly cleaned radiance and ineffable logic; there are no histrionics or theatrical tricks, nothing aggressively or distractingly interactive. The immediate appeal is to the eye; you are expected to meet the art on its own terms. Understatement prevails; less is definitely more. (Huxtable, 2012, p.2).

Code frequencies of style, aesthetics, and materials of the new wing were closely followed by those of the art collections or new exhibitions (many of them blockbuster shows) going to be displayed or on display in the new museum wing, accounting for 12.9% of codes. They were also found to occur in the highest percentage of cases (97.8%)—even more than style, aesthetics, and materials. These discussions were mostly found to be in the very beginning, while introducing the new wing:

...the Modern Wing will house four of the Art Institute's 10 collections: 20th Century works drawn from the museum's collections of European sculpture and painting, contemporary art, architecture and design, and photography. (Kamin, 2008, p. 2).

Sometimes, they were in the main body of the piece:

...there is calculated drama in the carefully planned vistas of stellar works that beckon you through a maze of intimate galleries that offer a somewhat confusing choice of routes. But you are deliberately and irresistibly drawn to iconic (the right word here) paintings like Emanuel Leutze's "Washington Crossing the Delaware" (1851), with its elaborately gilded, long-lost frame reconstructed from an 1864 photograph. The painting occupies a specially designed double-height gallery visible from a distance as you enter. A masterwork of the Hudson River School beckons you to a banquet of sublime 19th-century landscapes in another room. You will be lured to a gallery of Gilded Age portraits, including John Singer Sargent's legendary 'Madame X.' (Huxtable, 2012, p.2).

Both art and architecture were in fact, found to be a very central theme in the popular

press. This may seem obvious at first, for articles covering museum news, but we will see that some other important themes were left out of the news.

Under the category of architecture, a good amount of concern was directed toward the overall museum site planning (6.9% of codes, 84.4% of cases), light and views (6.5% of codes, 68.5% of cases), and size of the new addition (5.2% of codes, 81.1% of cases). Size was mentioned frequently, mostly in order to increase the glamor quotient of the addition. Statements such as “Designed by Steven Holl, the Bloch Building (in the Nelson-Atkins), as it's called, stretches below ground for 840 feet -- equivalent to a 67-story skyscraper -- and provides 165,000 square feet of space, two-thirds for galleries.” (Dobrzynski, 2007, p.1), or “The 264,000-square-foot wing (Modern Wing, AIC) is the largest expansion in the museum's 130-year history.” (Ouroussof, 2009, p.1), provided information about the scope and scale of the new museum addition.

What about high-profile ‘Starchitects’, designers, decision-makers, and other stakeholders involved in the museum addition project? These individuals were mentioned in a majority of cases. The architects were mentioned in 81.1% of cases and constituted 6.7% of coding frequencies:

The Modern Art Wing under way at the Art Institute of Chicago will bring the stylings of Parisian architect Renzo Piano to the Windy City for the first time. Piano, a winner of the Pritzker Prize, is best known for the Georges Pompidou Center in the City of Lights...The Art Institute of Chicago is gaining a hoped-for masterpiece with the addition of its Modern Wing by the internationally acclaimed Renzo Piano. (McKuen, 2008, p.1).

Museum directors, chairs, or trustees not to be left far behind, were mentioned in 66.6% of all cases and constituted 5.5% of the coding frequency. “It's got to be one of the best-

planned buildings ever,” said [Phoenix Art Museum] director Jim Ballinger. “We spent a whole year with the architects, planning space and crowd movement...We are paying close attention to user need.” (Nilsen, 1995, p.1).

Money usually makes news headlines and museum additions just like other new building projects, cost money. The conversation about money in the popular press, however, was focused mostly on the budgetary concerns and construction costs (4% of codes and 71.1% of cases) rather than on revised admission fees or membership costs (0.1% of codes and in 2.2% of cases) or employment (0.3% of all codes and discussed only in 8.9% of all cases)—factors that directly affect museumgoers and museum employees. Discussions on funding and endowments (2% of codes and in 30.1% of cases) and art acquisitions and donations for the new wing (0.6% of codes and in 15.6% of cases) were also more frequent than admission fees and employment. The importance of these matters was announced by statements such as:

With a \$41.2 million expansion and renovation, the [Phoenix Art] museum hopes to garner even more accolades... In 2001, Phoenix voters approved \$18.2 million in bond funds for the museum's expansion. ‘Our challenge was to then raise another \$23 million from private donors, corporations and foundations in a less than perfect economic environment,’ Ballinger [the museum director] said. (Blair, 2006, p.1).

Financing of the museum addition project, was treated as a matter of great urgency whereas user-centric issues were not. Practical matters at hand—funding, cost, art, image, and press releases always received top priority. Other concerns such as the building’s potential for long-term benefits to its occupants were found to be secondary.

The word cloud in figure 6.2 below is a another graphic representation based on the percentage of cases (articles) that contain key words and phrases.

## Word cloud of key words and phrases in critics' opinions of building additions to four museums



Fig. 6.2: Word cloud of code frequencies by percentage of cases. Source: author.

### Reactions to the building boom and the “Bilbao Effect”

Is the news of museum additions received positively or negatively by the popular press?

Most news articles and reviews on museum additions were found to have a positive tone.

Art, architecture critics, and other individuals quoted in these articles also voiced positive opinions. An example of a positive reaction can be seen in statements such as this one

about the Art Institute of Chicago’s Rice Building addition in the New York Times, made by well-known architecture critic Paul Goldberger:

The most striking thing about the exterior is how wonderfully it enhances one of Chicago's too-little-appreciated vistas, the view of the Art Institute from the south, the Chicago skyline and the tracks of the Illinois Central Railroad that bisect the institute's site, running between its major wings. Here, the shared industrial and Beaux-Arts legacy of this city is perfectly expressed - the train yard and the art museum are interlocked in a surprisingly cordial embrace, made friendlier still by Mr. Beeby's new architecture. (1988, p.2).

The first, and at times, the most obvious indication of a positive review of a museum building, was very often, in the news headline itself. One good example of such a headline was found in the newspaper USA Today: "This Bright Idea Is a Glowing Achievement" (Kennicot, 2007, p.1). Not surprisingly, it was followed by a rave review about architect Steven Holl's Bloch Building addition to the Nelson-Atkin's Museum in Kansas City, Missouri.

The number of positive opinions (6.7% of codes and 71.1% of cases) completely eclipsed the number of negative (2% of codes and 38.9% of cases) and neutral opinions (0.1% of codes and 2.2% of cases). Negative reactions, where found, were expressed by headlines such as: "The windy city blows it; Chicago is famous for its stunning buildings, but the new Modern Wing of its Art Institute shows the dangers of 'star-chitecture', reports Morgan Falconer", (2009, p.1) followed by lines such as:

...the city (Chicago) has put great hopes in Piano's Modern Wing. It is serene, efficient, and yet it disappoints. It offers up no singular image: there is no bold gesture, no Tate Modern Turbine Hall that one might learn to love. In fact, the designs that Gehry and Piano have supplied for Chicago point to the twin dangers of "star-chitecture": bombastic, signature gestures on the one hand, predictable products on the other. (Falconer, 2009, p.2).

Another example of a negative press review was:

There is much to admire about the new Modern Wing: its sleek blond oak floors, the Miesian suspended staircase, skylights through which you can perceive sun, clouds or rainwater, and expansive floor-to ceiling windows that offer attractive views of the city. But it leaves much to be desired in terms of audience-friendly, art-enhancing design. Visitor flow is impeded by the too-narrow staircase (single-file, both ways). This main circulation pathway leads to a similarly tight two-lane hallway outside the galleries. The rooms for large-scale contemporary work are more reminiscent of cramped office cubicles than expansive artists' lofts. (Rosenbaum, 2009, p.2).

The few neutral reactions that were found, were expressed by lines such as these in one article in the Chicago Tribune, that did not take a positive or negative stance, but assumed more of a wait-and-watch approach:

Come next year, Kansas City's leading art institution will have its moment in the national spotlight as the latest museum to unveil a major expansion, part of a building boom that has swept up museums of all sizes, from New York's Museum of Modern Art and the Art Institute of Chicago to the art museums in Grand Rapids, Mich., and Akron... But Andrew Zimbalist, a Smith College economist, believes the law of diminishing returns may mean that the Bilbao effect eventually will wear off. 'There's certainly an issue here about overbuilding and being duplicative instead of being creative,' Zimbalist said. (Swanson, 2009, p.1).

The word cloud graphic in figure 6.2 also highlights how important the new museum expansion is to the overall identity of the museum; the creation of a new icon that is symbolic of the city's image and progress. Categorized under "Identity/Image/Symbolism", this code which was found in 5.1% of all codes and 76.7% of cases.

Phoenix is getting a new image...The Phoenix Art Museum, like many other things in this young, ambitious state, is growing rapidly. Opened in 1959, it features nearly 20 exhibitions annually, including several tied to regional strengths. Of, course, it's expanding, too. The museum will remain open during a \$ 25-million expansion and renovation project that will more than double its size. (Rosenthal, 1995, p.1).

The findings of the content analysis clearly show that by and large the popular press had a favorable opinion of new museum wings and addition projects of the four case studies.

Critics and museum decision-makers, both, were in awe of the design attributes, aesthetics, and the art collection on display in the new addition building—there was a focus on the new building's overall mass appeal—rather than an investigation on its social, cultural, and human behavioral implications. Douglas David, sums up many of these trends in his article in Newsweek:

There was a time when Americans wanted their museums to be quiet country mansions...If they could see the sprawling Met of 1987, they would be shocked. The broad steps are jammed with kids, students and art lovers of all ages. Vendors hawk food, drink and jewelry; mimes lurch and grimace, dancers dance, guitar players strum. Inside, 4 million people a year throng the halls, ogling art, jamming the dining rooms, spilling into the shops to buy postcards, toys and more. In other cities the same spirit of populism has transformed virtually all of the major American museums founded a century ago. That once stately mansion is beginning to resemble a perpetually expanding theater of the absurd, reaching out to embrace every function and public in sight.

Where after World War II trustees and directors lusted to raise new buildings, they now itch to add immense wings...The indefatigable Met has just opened yet another in a parade of wings built since 1970 (costs to date: \$ 150 million), this one devoted to modern art. There is even grand ambition in Brooklyn, where Robert T. Buck, the new director, has hired two independent architects, James Stewart Polshek and Arata Isozaki, after a heated, open competition. They will repair and extend the museum's aging plant over the next 25 years, when -- and if -- the requisite \$ 200 million is raised. "Massive problems," says Buck, "demand massive solutions.

But winging it in the '80s has become very risky. Neither the public nor the critics have given up on the Arcadian ideal fostered in the last century. We now demand from our museums delights that weren't there in the past -- lavish restaurants and restrooms, posh theaters, trendy shops, quaint little open courts and gardens for repose; but we also want the unspoiled mansion of yore. (1987, p. 70).

The results of this content analysis highlight areas of concern as well as confirm the need for more research centered on the occupant experience in museum additions. The frequency of discussions on visitors ranked only eleventh (3.6% of codes and in 71.1% of cases) on the list and employees ranked even further down as fifteenth (1.8% of codes and in 43.3% of cases). Employees opinions when mentioned, were restricted to those of museum curators. Security guards', gallery docents', volunteers', librarians and other museum staff members' voices *went completely unheard*. Admission fees or membership costs for visitors (as discussed earlier) were not considered important to the central theme. The discussion on how museum additions would affect employment—increase or decrease job numbers was close to nonexistent. Articles that address these issues such as this one by

Robin Pogrebin in the New York Times appear to be few and far between:

Attendance did spike initially when the new wing (Modern Wing, AIC) opened in March 2009, but then it dropped back to normal levels. A precipitous decline in endowment income led to pay cuts, furloughs, a salary freeze and two rounds of layoffs. (2012, p.1).

Other than these few exceptions, when it comes to new museum wings, the actual occupants of the museum—employees and visitors; *the users of the space are mostly left out of the conversation and ignored by the popular press.*

The content analysis of popular press articles gave a good indication of prevailing trends and issues in museum additions from outsiders' perspectives. The results and discussions in the sections that follow will help us better understand the effects of these additions from employees' perspectives via firsthand accounts of their own experiences and perceptions.



## **Part 2: Survey Results: Employee perceptions and experiences of back stage spaces and front stage spaces of the museum**

The Nelson-Atkins Museum of Art and Phoenix Art Museum employees participated in an online survey about their perceptions and experiences in the back stage spaces and front stage spaces of the museum. 49 out of 200 employees at the Nelson-Atkins Museum of Art completed the online survey, resulting in a response rate of 24.5% at the Nelson-Atkins. 26 out of 85 employees at the Phoenix Art Museum completed the online survey, resulting in a response rate of 30.59%. In total, 75 out of 285 overall responses were received for the online survey of museum employees resulting an overall response rate of 26.32% for the survey. The two samples of responses were analyzed separately, and combined.

Complete survey questionnaire formats for online surveys conducted at both museums can be found in Appendix B. Both surveys were identical except for the last question, which solicited employees' reactions to critics' statements on additions to their museums.

Survey results from full time employees at both the Nelson-Atkins (referred to as "N-A" in the discussion) and Phoenix Art Museum (referred to as "PX" in the discussion) are organized into different categories and discussed in this section.

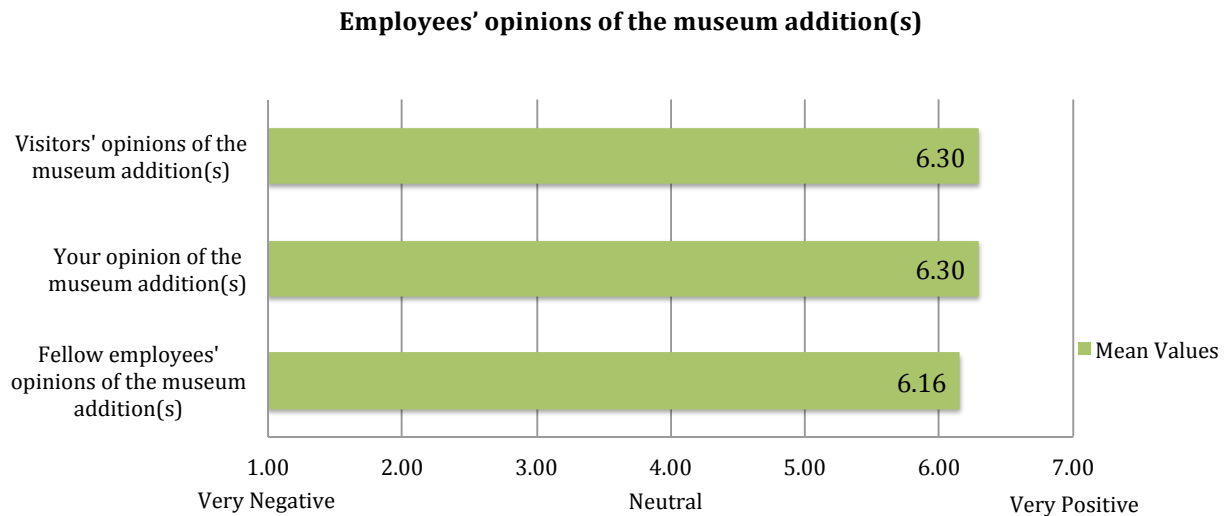
### **Respondent profiles: Length of employment and job description**

The amount of time that museum employee respondents had worked at the museum varied from 3 months to 27 years. The average length of employment at the museum from the sample of all museum employee respondents was 7.5 years; 8.4 years in N-A and 4.2 years in PX.

The sample of museum employees consisted of a wide variety of job profiles. Out of the 75 respondents, two did not specify their job descriptions or titles, and out of the remaining 73, the largest group of respondents was that of curators (seven) of different types of art (Asian Art, Photography, Modern Art, or unspecified) and of different levels of responsibility (one Senior Curator, four Curators, one Associate Curator, and one Assistant Curator). This next largest group was that of Human Resources employees; six in total, consisting of five HR Managers and one HR Coordinator, followed by four Directors (Administration, Conservation and Collections Management, Education, and Human Resources). The smallest groups consisted of one individual each—an executive chef, an exhibition installer, a lead ticket sales associate, a retail sales associate, a senior photographer, a staff accountant, a store clerk, and a web and social media coordinator. Other job categories in groups of two to five individuals included restaurant managers, maintenance staff, engineers, gallery attendants, conservators, imaging services staff, visitor services staff, event management staff, program assistants, registration staff, library staff, and education staff.

### **Overall opinions of the museum addition(s)**

Employees were asked to rate their overall opinion about the museum addition on a scale of 1 to 7, where 1 was 'very negative', 2 - 'negative', 3 - 'somewhat negative', 4 - 'neutral', 5 - 'somewhat positive', 6 - 'positive', and 7 was 'very positive'. The mean values of all their selections were calculated. The results are shown in figure 6.3 below:

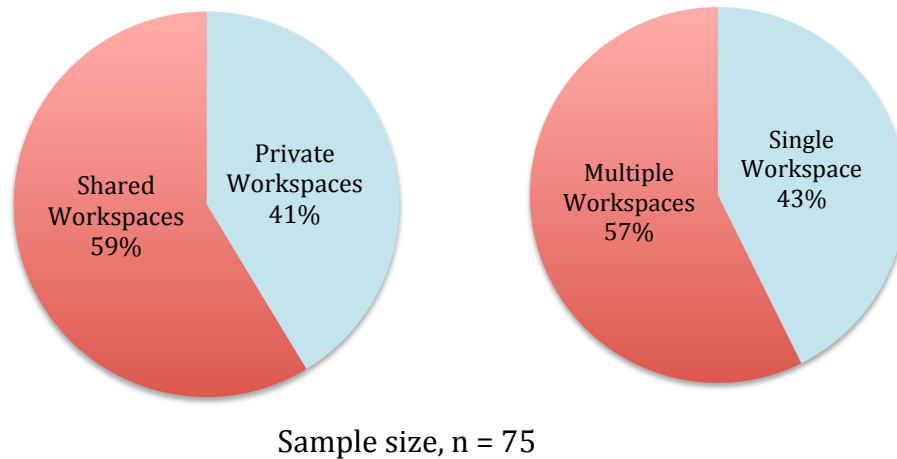


Sample size, n = 64

**Fig. 6.3:** Employees', fellow employees' and visitors' opinions (according to employees) of the museum addition(s) at the Nelson-Atkins Museum of Art and Phoenix Art Museum. Source: author.

We see that most employees had a positive opinions about the museum addition(s) (mean = 6.30 combined, 6.39 in N-A, and 6.10 in PX). We also see that they perceived their fellow employees' opinions and visitors opinions as being positive, as indicated by mean values of 6.16 (6.20 in N-A, and 6.05 in PX) and 6.30 (6.32 in N-A, and 6.25 in PX) respectively, and shown in figure 6.3 above. They, however, identified a number of opportunities for positive change that are discussed in detail later.

## Work space descriptions: Private vs. shared, single vs. multiple



**Figs. 6.4 and 6.5:** Number of private vs. shared work spaces and number of individuals working in a single space vs. the number of individuals working multiple spaces throughout the day. Source: author.

Figure 6.4 above indicates that out of the 75 respondents, 41% (31 total, 48% (24) in N-A, and 28% (7) in PX) had a private work space such as their own office and 59% (44 total, 52% (26) in N-A, and 72% (18) in PX) worked in a shared space such as in a cubicle in a large open work area, a desk in a central walkway, a desk in a large room with others or in public areas described by responses such as “We cover the entire museum. There is no “office” for us, just a small just-remodeled employee rest area and a smaller staff room in the other half of the museum.” Further, 43% (32 total, 36.7% (18) in N-A, and 53.8% (14) in PX) respondents worked in a single space, and 57% (43 total, 63.3% (31) in N-A, and 46.2% (12) in PX) worked in multiple spaces throughout the day, as shown in figure 6.5 above.

What was the impact of the new museum addition(s) on the location of employee work spaces? 22.67% (17 total, 7.7% (2) in N-A, and 29.4% (15) in PX) of respondents said that their work location changed after the new addition was constructed and 14.67% (11 total,

42.3% (11) in N-A, and 0% (0) in PX) said that their location was unchanged. The remaining 65.3% (49 total, 50% (13) in N-A, and 70.6% (36) in PX) did not indicate whether their work space location had changed, probably because most of them started work after the last addition was built; 57.33% (43 total, 55% (27) in N-A, and 64% (16) in PX) had worked at the museum for 7 years or less, after the 2007 Nelson-Atkins addition and the 2006 Phoenix Arts Museum addition were built. When the work space location did change, however, it was not always an improvement over the previous one, a fact that was brought to light by statements such as: “[I work in the] library stacks (basement). Yes, location changed to new addition--but still the basement.”, “Our offices are in the basement. With no windows. Yes.”, and “[My workspace was] transformed from storage closet to office. Away from the rest of the department.”, “My current office is in the collections management suite on the B [basement] level of the new building. Before that my office was in a loft above painting conservation in the top floor of the old building...”, and “B (basement) Suites. Yes, location changed after Bloch Building was completed”.

12% (9 total, all 9 in N-A and 18.4% of N-A respondents) of respondents, in fact, stated that their offices were located in the museum basement—and there are probably more; most responses simply specified the department name such as “Administration suite” or “Educational facility”, and did not mention its floor level or location in the building. Further, many of these spaces, as we will see, were windowless; affording no outside views and receiving no natural light.

Some employees were inconvenienced due to a constant change in their office location due to the new construction, and made it known in their responses:

[I work in a] suite of administrative offices with mixed departments; I have moved offices three times in 12 years.” or “I was relocated 4 or 5 times over 5 years prior to settling into a permanent office. This was due to the building of the new building; as the new building became usable and offices moved to it [and] the 1933 building was going through a series of renovations that added and upgraded a large amount of office space.

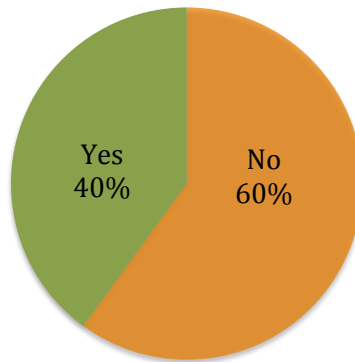
One individual’s office size was actually cut down after the expansion was completed: “My office is in the Museum building proper. My office was reduced in size during the last building expansion.” Only one response indicated a possible positive change; one employee’s office was moved from off-campus site and into the new addition building: “[I am] currently located on the 3rd floor of the Nelson building. Location changed with the opening of the new Bloch Building. Before that I was in an entirely different building, One Main Plaza on Main Street, off the museum grounds.” There was no indication, however, whether or not this individual was moved to the basement.

## **Daylight and views**

### **Openings and views: Availability, size, and orientation**

The locations of employee work spaces led to our next question: How many employees had an available opening (window/door/skylight/other) to the outside from their work spaces? Results shown in figure 6.6 below indicate that 40% of respondents (30 total, 36.7% (18) in N-A, and 57.1% (12) in PX) had a view by means of an opening such as a window, door, skylight, or a combination of these types, whereas 60% of respondents (40 total, 63.3% (31) in N-A, and 42.9% (9) in PX) did not.

### Does your work space have an opening to the outside?



*Sample size, n = 75*

**Fig. 6.6:** Percentage of respondents in the Nelson-Atkins Museum of Art and Phoenix Art Museum combined, with and without an opening (door/window/skylight/other) to the outside. Source: author.

The types of available openings varied. Out of the 30 respondents who had an available opening, 17 (9 in N-A, and 8 in PX) respondents had at least one available window, six (one in N-A, and five in PX) had at least one available door, three (none in N-A, and three in PX) had both doors and windows, and two (one in N-A, and one in PX) had a door, window, and a skylight. Two did not indicate what type of opening they had. There was also a variation in the quality of opening(s) and the views that they afforded. One individual who was not very fortunate in this regard, said: “We have an emergency exit door. No windows. That's it.”

One individual had only indirect openings (they looked into adjoining spaces and did not face directly outside), as indicated by the survey response: “[One] door, two windows - one window that faces cubicle space, one window that faces another office, through which I can see outside”

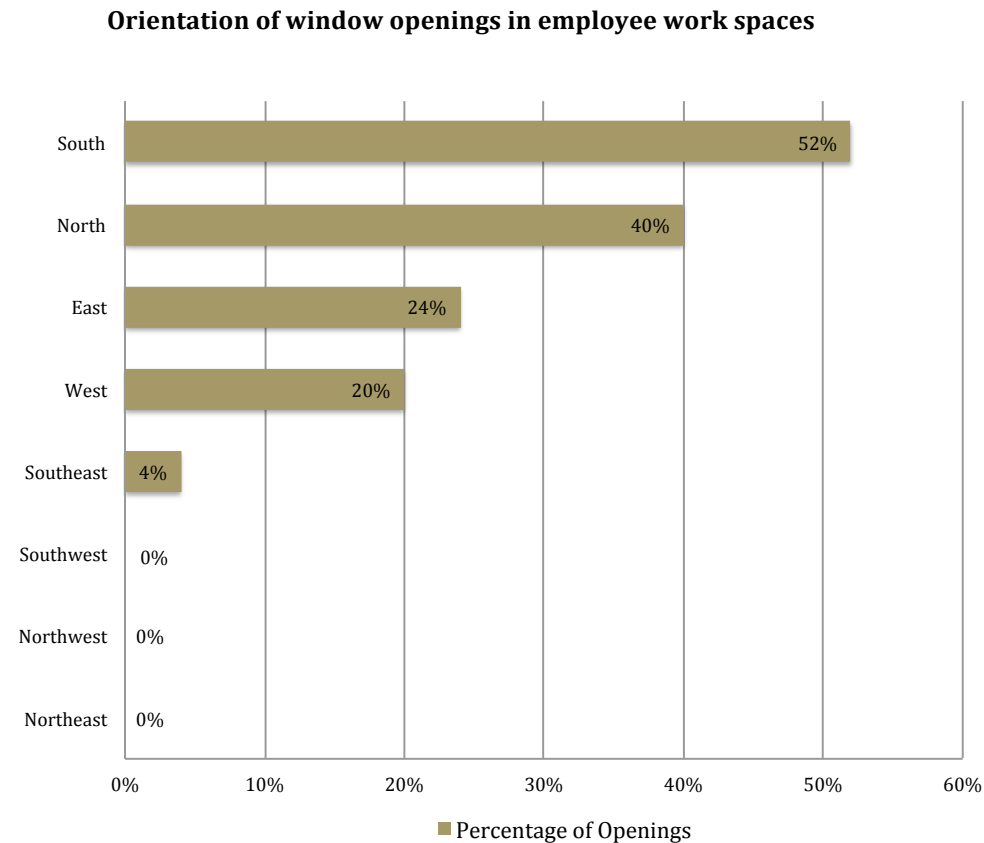
Two individuals had multiple openings available; one had “Floor to ceiling glass on two walls facing our front entrance and side street”, and another had “multiple openings including windows, skylights, doors, etc.”.

24 out of 30 respondents specified the size of their available openings. These sizes varied from 5 square feet to 300 square feet. The average opening size for an employee was found to be 80 square feet across the sample—quite generous, but we need to keep in mind that this size was the average for only the minority group of respondents who had available openings in the first place (40%, 30 total, 19 in N-A, and 11 in PX), and then went on to specify the opening size (32%, 24 total, 16 in N-A, and 9 in PX). The orientation of openings (the direction that they faced) was asked next, in order to assess what direction and quality of daylight that was available to the occupant throughout the day. 40% of openings faced north, 52% faced south, 24% faced east, 20% faced west, and 4% faced southeast as shown in figure 6.7 below. The percentages of openings do not add up to 100% because one or more employees had openings that faced multiple directions.

We see that most openings (52%) had access to direct sunlight for most of the day since they faced south, followed by the group that faced north (40%) potentially having access to uniform diffused daylight throughout the day. The percentage of east and west facing openings (24% and 20% respectively) however, was found to be slightly high considering the fact that east and west get high levels of radiation from the sun in the mornings and evenings. South facing windows however, are not always desirable, especially in hot and dry cities such as Phoenix, Arizona in which the Phoenix Art Museum is located (Hindrichs, D. U., & Daniels, K., 2007). This issue was also brought to light by one respondent who said,



“...Surprisingly, offices with windows facing directly outside are not most desirable. Temperature here in Phoenix is an issue for offices with south-facing windows...”.

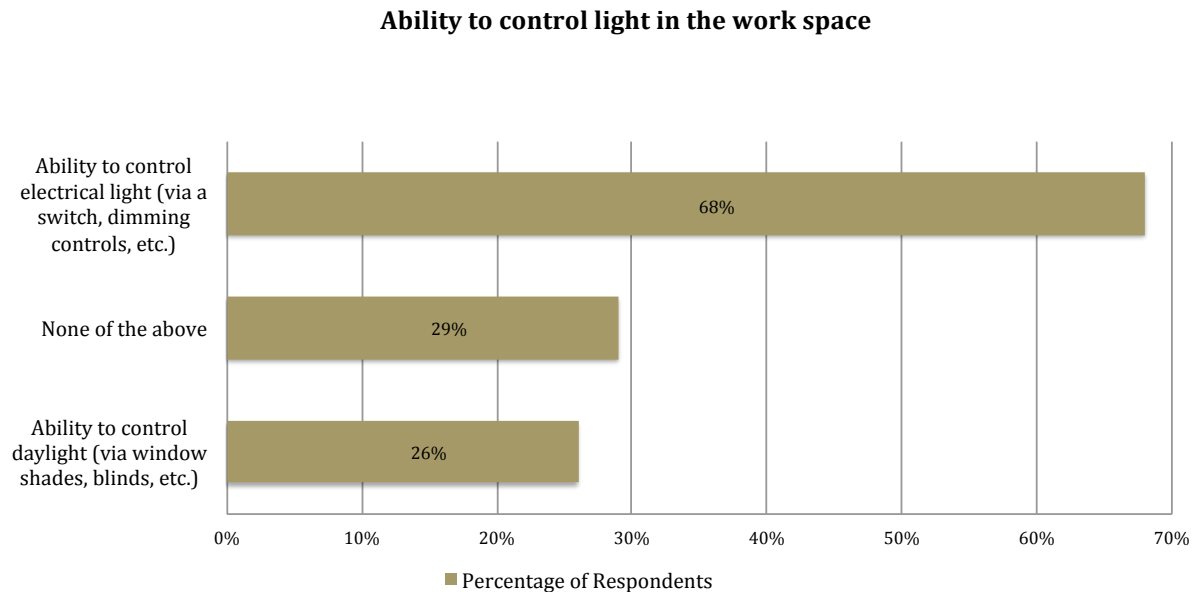


Sample size, n = 35

**Fig. 6.7:** Orientation of openings in museum employee work spaces at the Nelson-Atkins Museum of Art and Phoenix Art Museum. Source: author.

Did museum employees’ have the ability to control both electrical and/or daylight in their work spaces? Figure 6.8 below indicates that 68% of respondents (45 total, 31 in N-A, and 14 in PX) had the ability to control electrical light, however, only 26% (17 total, 14 in N-A, and 3 in PX) had the ability to control daylight via mechanisms such as shading devices, and 29% (19 total, 11 in N-A, and 8 in PX) had no ability to control both sources of light—electrical or daylight at all. We know that daylight changes in direction, intensity, and color throughout the day and an inability to control daylight via shading mechanisms may lead to

undesirable conditions in the work space such as excessive glare and heat for the individual, thereby affecting their satisfaction levels (Cuttle, 2000)—as we will see.



Sample size, n = 81

**Fig. 6.8:** Percentages of respondents who had the ability to control light (daylight/electrical) in their work spaces at the Nelson-Atkins Museum of Art and Phoenix Art Museum. Source: author.

Now that we have information on the size, types, orientation of openings, and ability to control light, how much were employees satisfied with the views and daylight available to them?

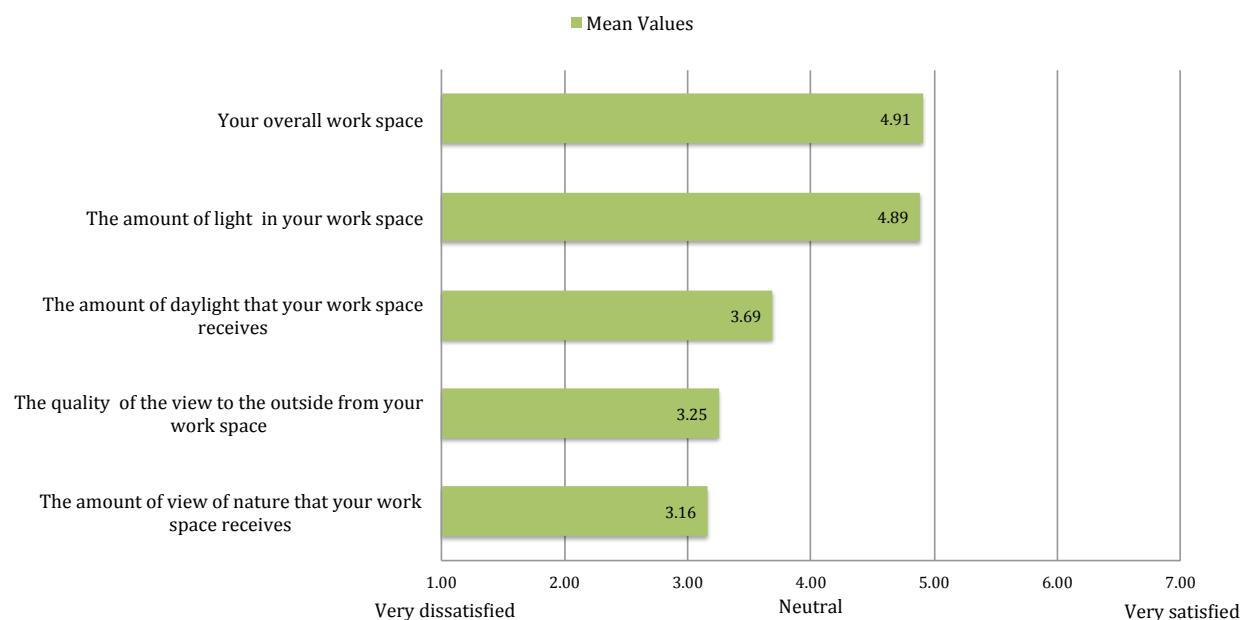
### **Satisfaction with views and daylight**

Employees were asked to rate their levels of satisfaction with views and daylight in their work spaces on a scale of 1 to 7, where 1 was 'very dissatisfied', 2 - 'satisfied', 3 - 'somewhat dissatisfied', 4 - 'neutral', 5 - 'somewhat satisfied', 6 - 'satisfied', and 7 was 'very satisfied'.

The mean values of selections made by respondents are shown in figure 6.9 below. We see that employees, on average, were only somewhat satisfied with their overall work spaces

(mean = 4.91 combined, 5 in N-A, and 3.27 in PX) and the amount of light in their work spaces (mean = 4.89 combined, 4.97 in N-A, and 4.77 in PX). They felt mostly neutral (mean = 3.69 combined, 3.66 in N-A, and 3.75 in PX) about the amount of daylight that it received, and somewhat dissatisfied (mean = 3.25 combined, 3.11 in N-A, and 3.5 in PX) about the quality of view and the amount of view of nature (mean = 3.16 combined, 3.17 in N-A, and 3.15 in PX) that was available from their work spaces.

#### Employees' satisfaction with views and daylight in their work space



Sample size, n = 66

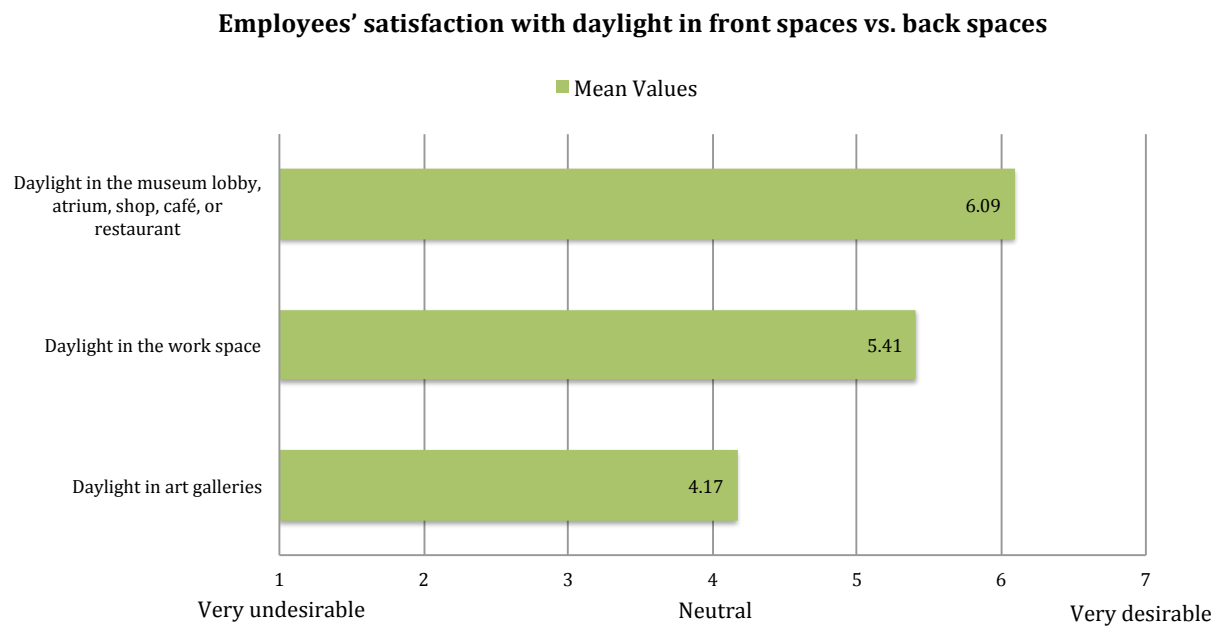
**Fig. 6.9:** Employees' mean levels of satisfaction with views and daylight in their work space at the Nelson-Atkins Museum of Art and Phoenix Art Museum. Source: author.

We see that most respondents were not satisfied—even somewhat, with the amount of light, daylight, views and quality of views from their work spaces which may have contributed to their feeling of being only somewhat satisfied with their overall work spaces.

### **Desirability of daylight in the museum front spaces (public/visitor areas) vs. back spaces (employee work areas)**

Employees were asked to rate their levels of desirability with daylight in museum frontspaces and backspaces on a scale of 1 to 7, where 1 was 'very undesirable', 2 - 'desirable', 3 - 'somewhat desirable', 4 - 'neutral', 5 - 'somewhat desirable', 6 - 'desirable', and 7 was 'very desirable'. Their responses were given a score in the range of 1 to 7 as per the selection made.

The mean values of their responses are shown in figure 6.10 below. It is not surprising to find that daylight was somewhat desired or desired (mean value = 5.41 combined, 5.45 in N-A, and 5.32 in PX) in the work space considering that in the previous response, they were neutral towards/somewhat dissatisfied (mean = 3.69 combined, 3.66 in N-A, and 3.75 in PX) with the amount of daylight that it received. Daylight in art galleries on the other hand was met with a neutral level of desirability (mean = 4.17 combined, 4.09 in N-A, and 4.33 in PX), while daylight in the museum lobby, atrium, shop, café, or restaurant was much more desired (mean = 6.09 combined, 6.02 in N-A, and 6.23 in PX).

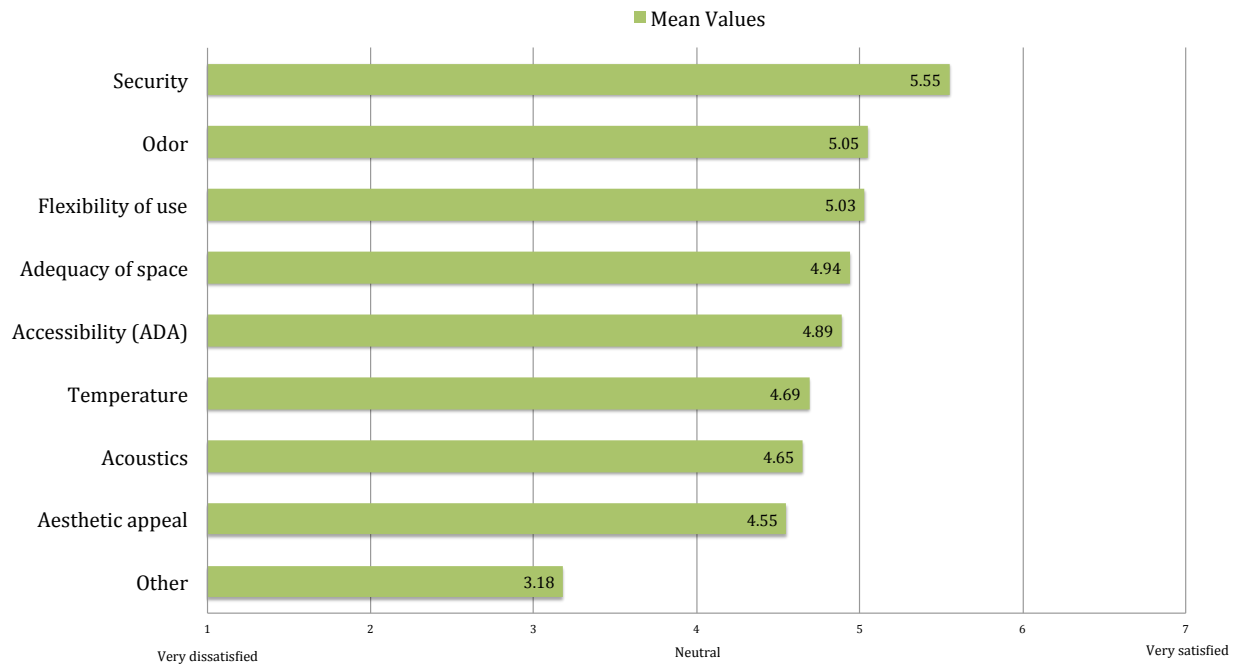


Sample size, n = 66

**Fig. 6.10:** Employees' mean levels of satisfaction with daylight in museum front spaces vs. museum back spaces at the Nelson-Akins Museum of Art and Phoenix Art Museum. Source: author.

In summary, we find that employees desired daylight in museum backspaces, while in frontspaces they desired daylight mostly in visitor circulation or common areas but not art galleries; spaces in which they may been unsure as to whether or not it worked, because of art conservation issues. They appeared to be well aware of issues of daylight levels and art conservation in art galleries.

## Satisfaction with various design attributes of the museum



Sample size, n = 65

**Fig. 6.11:** Employees' mean levels of satisfaction with various museum design attributes at the Nelson-Akins Museum of Art and Phoenix Art Museum. Source: author.

Out of all the categories, we see from the chart in figure 6.11 above that respondents were only satisfied with 'Security' in the museum (mean = 5.55 combined, 5.65 in N-A, and 5.33 in PX). They were somewhat satisfied the remaining categories—'Accessibility' (4.89 combined, 4.77 in N-A, and 5.14 in PX), 'Flexibility of use' (5.03 combined, 5.07 in N-A, and 4.95 in PX), 'Odor' (5.05 combined, 4.98 in N-A, and 5.19 in PX), 'Temperature' (4.69 combined, 4.68 in N-A, and 4.71 in PX), 'Acoustics' (4.65 combined, 4.98 in N-A, and 3.95 in PX), and 'Adequacy of space' (4.94 combined, 5.05 in N-A, and 4.71 in PX), except for the category of 'Other'. In this category, respondents were given the option of specifying other design attributes and rating them on the same scale. For this, they specified additional design issues in the museum such as 'ADA functionality', 'Leaks and condensation',

'Window', 'lack of nearby restroom, none on 3rd floor', and 'Privacy for focus.' On average, they were somewhat dissatisfied (mean = 3.18 combined, 3.3 in N-A, and 2.7 in PX) with all these environmental/design features. 'ADA functionality' was repeated even though accessibility (ADA) was provided as an option, probably because some respondents may have confused them as being separate issues. In any case, both categories had relatively low scores (means of 4.89 and 3.18 combined, 4.77 and 3.3 in N-A, 5.14 and 2.7 in PX) compared to the rest.

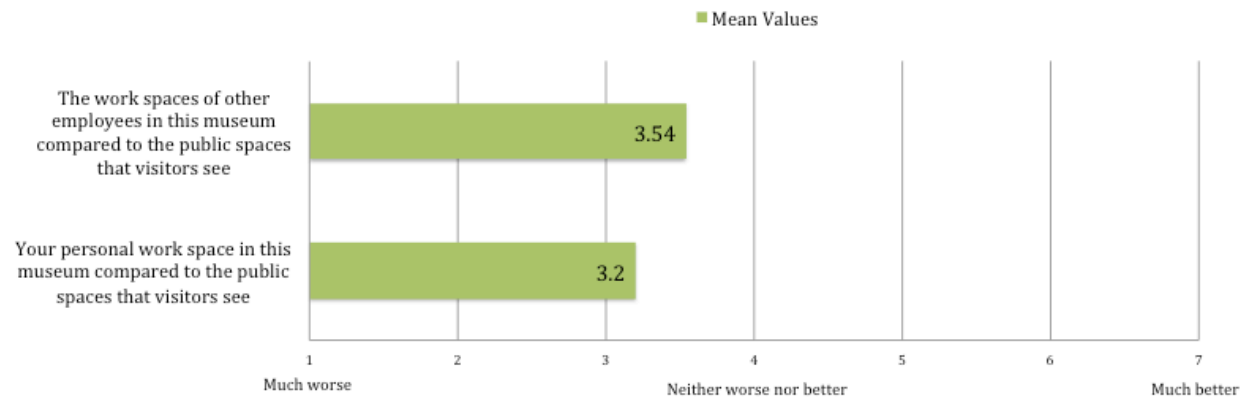
We can conclude that for all the design attributes listed above, both museums , on average , received less than stellar ratings from survey respondents; none of the response means hit the 'satisfied' or 'very satisfied' mark.

### **Back stage spaces vs. front stage spaces**

The comparison of back stage spaces of the museum to its front stage spaces was one of the central research questions of this study. Employees, therefore, were asked to rate their perceptions of back stage spaces—their own work spaces as well as those of fellow employees—as compared to the front stage spaces (public/visitor areas) of the museum on a scale of 1 to 7, where 1 represented 'much worse', 2 – 'worse', 3 – 'somewhat worse', 4 – 'neutral', 5 – 'somewhat better', 6 – 'better', and 7 represented 'much better'. The mean values of all 65 responses received to this question shown in figure 6.12 below, tell us that employees perceived their own work space to be somewhat worse than the public spaces of the museum (mean = 3.2 combined, 3.28 in N-A, and 3.0 in PX) and their fellow employees' work spaces to be neither worse nor better than theirs (mean = 3.54 combined, 3.5 in N-A, and 3.62 in PX). We can also conclude, therefore, that they perceived fellow

employees' work spaces, to be better—even if only marginally—than their own.

### Employees' perceptions of back stage spaces vs. front stage spaces



Sample size, n = 65

**Fig. 6.12:** Employees' perception of backspaces used by themselves and other employees vs. frontspaces used by visitors in the Nelson-Atkins Museum of Art and Phoenix Art Museum. Source: author.

### Which work spaces in the museum, if any, are the best and why?



Sample size, n = 51

**Fig. 6.13:** Employees' most preferred work spaces in the Nelson-Atkins Museum of Art and Phoenix Art Museum . Photo: Executive meeting office in the Bloch Building, Nelson-Atkins Museum. Image and infographic source: Author



Out of 51 museum employee who responded for this question, most (80.39%, 41 total, 31 in N-A, and 10 in PX) clearly found work spaces with daylight and views to be most desirable as shown in figure 6.13. A large percentage (47.06%, 24 total, 23 in N-A, and one in PX) of respondents preferred private offices, but once again, windows for natural light and outside views appeared to be the deciding criterion for any work space as being the best, as highlighted by these sample responses:

The executive offices in the Bloch building. They have copious natural light, are large and airy, and quiet. The office suite on the NW Mezz is also very nice. They have windows, lots of natural light, and bright offices although they are small.

Conservation and some of the curatorial offices. There are windows, high ceilings, and natural light.

The Director's office. He has large windows, quite area, close to library reading room, and great light.

Some respondents also selected public spaces in the museum such as art galleries, and entrance lobbies as being the best because of the availability of natural light.

Many respondents were not clear as to which work space was the best, but they specified features that they desired in a work space, as revealed by responses such as these:

I think everyone works best with their own desk and ultimately one next to a window. Most staff here have their own work space; not everyone has a window.

ours! we do have daylight - even if filtered by blinds", "... From my own perspective, those that offer a private office, a door, and a window are best.

Those with windows for natural light. Those that are in the Bloch (new) building, because the grease traps in the Nelson-Atkins (old) building are often emptied and disseminate a smell of raw sewage throughout our workspaces.

A few responses specified criteria other than daylight and views:

Work spaces in plain sight to the public are best. Visual appeal is valued and considered of high importance to our staff and improves our overall image.

The second level Admin Building houses the best work spaces because they are updated, clean, surrounded by artworks and often windows. The walls are painted calm colors and the surrounding areas are un-cluttered.

### Which work spaces in the museum, if any, are the worst and why?



Sample size, n = 51

**Fig. 6.14:** Employees' least preferred work spaces in the Nelson-Atkins Museum of Art and Phoenix Art Museum. Photo: Basement work spaces in the Phoenix Art Museum. Image source: Author. Infographic by author.

Figure 6.14 shows most museum employees (50.98%, 26 total, 16 in N-A, and 10 in PX) described work spaces without natural light as being the worst by far. 45.1% of respondents (23 total, 16 in N-A, and 7 in PX) specifically mentioned 'basement', or used the terms 'B-level', or 'underground' spaces. Employees described these types of work spaces (with no natural light/basement) with responses as follows:

Administration cubicles. No natural light, no views, hodge-podge seating. Cube farm.

Anyone in the B-levels [Basement level]-- all artificial light!

Curatorial Departments [that] are all underground, no day light and very cold.

My former work space, which were office cubicles set up in a former gallery space with no windows, and not real control over the lights (nor doors either) were far worse than what I have now. Some employees still must use these spaces....

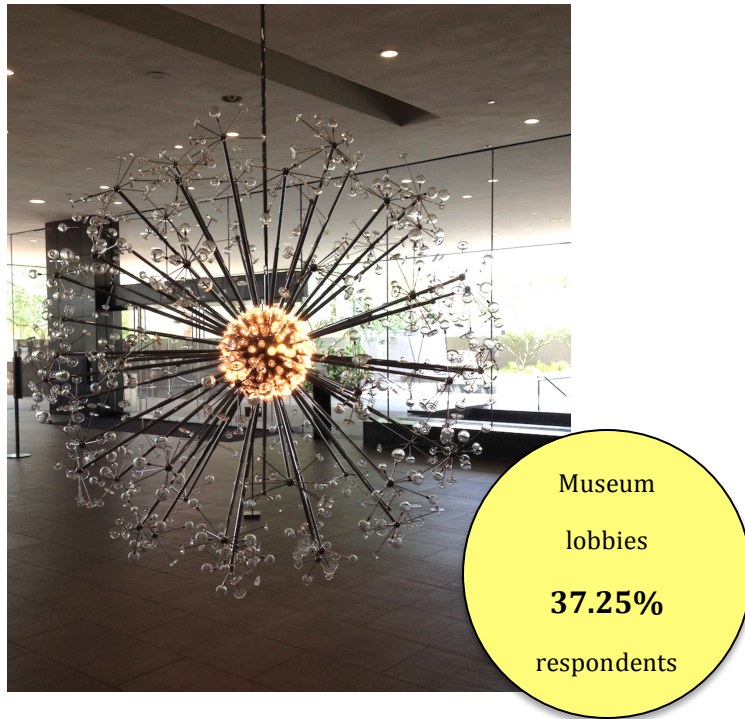
Some work spaces in the Block Building are deeper in the basement than mine. I think it would be hard on the psyche to be located that far underground. It takes a while for the employees to climb out of them.

The work spaces in the levels very far below ground are even more airless and isolated than my "closet under the stairs."

Of all the respondents who described their work spaces as being undesirable due to characteristics other than natural light or being in the basement, one response especially stood out amongst others:

My workspace is next to a public restroom. There is no controlled temperature since it used to be a storage closet. It is very cold in our office year round. We have an electric heater that we must run year round to warm the space, but we need to turn it on and off, acting as our own thermostat. The space is shared by myself and one other person...we are often forgotten to be included in group activities- the reason being 'Well, you two are just so far away from the rest of us...' There is a sliding "ticket window" about 30 inches away from my face, a doorbell, and a door that the public opens frequently. Because much of my work is detail oriented, this is very distracting. The loud sounds of school groups lined up to use the restrooms penetrate the window at intervals throughout the day.

## Which public spaces in the museum, if any, are the best and why?



Sample size, n = 51

**Fig. 6.15:** Employees' most preferred public spaces in the museum. Photo: Greenbaum lobby in the Phoenix Art Museum. Image source: Author. Infographic by author.

The largest group of respondents (37.25%, 19 total, 11 in N-A, and 8 in PX) as shown in figure 6.15 above, felt that museum lobbies were the best and most attractive spaces in the public part of the museum, followed closely by the second group (29.41%, 15 total, 10 in N-A, and 5 in PX) which felt that one particular art gallery or certain art galleries were the best. The reasons given for selecting lobbies were that they were large, open, airy, filled with natural light, or because they had spaces to sit as well as display art.

I think the best public spaces are the lobby areas since they provide a great, roomy, entry point to the museum where you have your first experience inside the building. It is also a plus to have areas where you can sit down and be comfortable and relax. If art is available, also a great place to display an exhibit.

The lobby, prior to adding works of art, was a mausoleum-like experience. We now display works of art, changing exhibitions, and added seating to encourage lingering, exploration, and the means to relax in that large space.

Lobby (windows), all of them really seem great - the lower level just has general feeling of being un feng shui.

Some respondents chose art galleries because of the art on display, their design, popularity with visitors, or simply because they were the latest upgrades of the museum.

Our galleries [are the best public spaces]. This is where money was spent for updating.

Personally, I like the Chinese Temple as it is an immersive experience and it is quite popular with visitors...

The galleries are surprisingly successful at exhibiting art inspite of being so “designed.”

15.69% of respondents (8 total, all in N-A) said that they liked all public spaces in the museum, with responses such as:

I cannot choose - they are all beautiful.

All of the public spaces in the museum are gorgeous and inspiring.

All above ground spaces are good because of space and lighting.

13.73% of respondents (7 total, 3 in N-A, and 4 in PX) said that they liked the entire new addition building or wing, with responses such as: “Katz wing for the open space”, “Addition, like the clean lines and white walls”, and “The Bloch building is so light and the art is great to view there”.

Natural light and openness were recurring themes in most survey responses for this question. Surprisingly, only one employee mentioned the museum store, and only three

mentioned the restaurant or café—museum areas usually perceived as being popular with visitors—as being the best public spaces of the museum.

### Which public spaces in the museum, if any, are the worst and why?



Sample size, n = 47

**Fig. 6.16:** Employees' least preferred public spaces in the museum. Photo: Art gallery in the Phoenix Art Museum (left) and a gallery walk (right) in the Nelson-Atkins Museum. Images source: Author. Infographic by author.

Results shown in figure 6.16 above indicate that two types of public spaces in the museum: Art galleries and circulation areas were voted equally as being the worst by two groups of 18 respondents each (12 in N-A, and 6 in PX), and each of them constituting 38.3% of the sample of 47 respondents. The art galleries, however, were the ones in the older museum building that were not upgraded as part of the new addition project or separately afterwards. Some of their responses were as follows:

The maze of rooms in the old building where people get lost and can't sit.

The galleries, which is where the art is, our reason for existing.

Some of our older galleries -very dark and unwelcoming.

Circulation areas, common spaces and some older entryways were disliked for a variety of reasons:

The Gallery Walk. Although lovely, it's a very long way to walk for visitors, there are stains on the ceilings from water leaks, and some of the ramps are rather steep, again making it hard on visitors.

I think mezzanines are the worst spaces here at this museum. They are merely passing spaces between floors and sometimes are utilized as galleries, which can be awkward. It is wasted space but at the same time unfunctional space.

Our former entrance lobby, which is now a large open space that is undefined and feels like an area you need to get through on your way to somewhere better.

The second largest group (8; 18.6% total, 4 in N-A, and 4 in PX) was that of respondents that did not feel there were any bad public spaces in the museum at all. They expressed this opinion by comments such as:

I think our museum is very attractive, so I can't think of a public space in the museum that is not beautiful and pleasing.

None, our Museum is beautiful.

I don't think there are any that are the worst - they are just different.

Two respondents stated public restrooms as being the worst ("Bathrooms, always messy looking", "Plaza level men's & women's restrooms in Nelson Building due to fixtures and floors") and four described a museum café or restaurant as the worst space in the museum ("Creative Cafe is a dead space with little traffic", "Museum restaurant. Acoustics are terrible.").

One respondent did not specify which public space was the worst, but stated the reasons why it didn't work very clearly:

Undefined spaces are lost spaces. If people don't know why they should use it, why would they? They won't. We have one area in recent discussion and revision after revision because it is somewhat of a blank canvas, a space for all needs, but then people don't seek it out, and therefore, visitor use is sporadic and minimal.

### **(Missed) Opportunities**

Museum employees were asked the question: If you had an opportunity to change one thing in the museum addition building, what would it be?

Out of the sample of 53 responses that were received, the largest group of respondents (30.19%, 16 total, 13 in N-A, and 3 in PX) pointed to visitors' wayfinding problems in the museum—consisting of entry sequences, moving around, reading maps, effective signage, and finding spaces without getting lost. More spaces for visitors to sit and employees to take breaks were also included in the same wish-list.

I think it is confusing to the public to have multiple entry points into the museum. People do not know what door to use when walking outside and not coming in through the parking garage.

I would get rid of the 'hills' to get the galleries, it is hard for people with physical disabilities to get around...

More spaces for staff to take breaks. Specifically security officers.

Signage for the restaurant, that is visible from the street. Both venues may benefit from impulse reactions to the signage.

The ramps are way too steep for wheel chairs even if they do meet ADA standards. I have push[ed] 2 different people on several different occasions. Going down the ramps, one has to really hang on, lean backwards for more weight leverage in order to keep the chair from going too fast down the ramps. Heaven help us all if the chair got away. Worse, pushing someone in a wheel chair up the ramps--body weight,



gravity, incline. Not easy. There is no elevator from the lowest level in Block. There is one about half way between the bottom and the Visitor's Service Desk. Helpful to have more benches, chairs, relaxing areas for visitors closer to the art areas...

Six employees (11.32% total, all in N-A) strongly felt that the museum needed urgent repairs—especially leaks through the ceiling that needed to be fixed (observations in the Bloch building, Nelson-Atkins Museum, later confirmed this condition).

Three respondents (5.66% total, one in N-A, and two in PX) wished for more non-art related/office storage and two (3.77% total, all in PX) wished for more art-related storage space in the museum.

Three respondents (5.66% total, all in PX) interestingly, wished for the museum building to expand further, and expressed this opinion by comments such as:

Expand the Asian Galleries.

I would love for Phoenix Art Museum to be able to continue to expand and upgrade its storage spaces for collection objects.

I would redesign the North Wing by expanding it and adding an additional floor to the top.

Three employees (5.66% total, all in PX) wanted changes that had nothing to do with the building design, but with the museums operations and administration policies. They desired the following changes:

Having a more positive feed back from our Admin Building Staff for the museum Employees.

Provide the security staff with self-defense training.

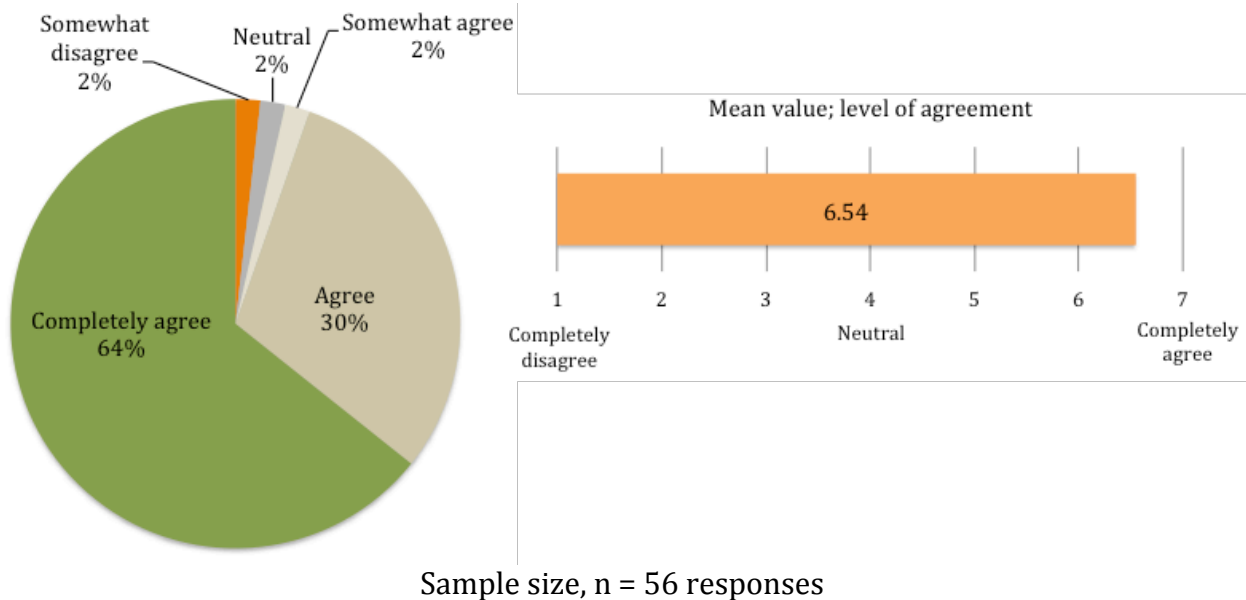
Re-work the financial system/build the endowment for more consistent money flow.

### **Agreement/disagreement with critics' statements**

Museum employees of both museums were asked whether they agreed or disagreed with four selected critics' statements expressing their opinions towards the new museum addition(s). The statements were alternated between positive and negative; the first and third statements were positive, and the second and fourth statements expressed negative opinions of the museum additions. Further, because each of these statements were unique; they criticized or praised an addition for its characteristics in a different way, the two museum employee samples (56 – Nelson-Atkins, and 22 – Phoenix Art Museum) were analyzed separately for this question. Employees were asked to rate their level of disagreement/agreement on a scale of 1 to 7, where 1 was 'completely disagree', 2 - 'disagree', 3 - 'somewhat disagree', 4 - 'neutral', 5 - 'somewhat agree', 6 - 'agree', and 7 was 'completely agree'. Their responses were given a score in the range of 1 to 7 as per the selection made; indicating their level of disagreement/agreement with the statement. For each statement, the level of agreement/disagreement by employees is represented by the mean value of all their responses, shown in the graphic immediately below each statement. Note that the employees were not provided with citations (critics' names, publication sources, or any identifying information) associated with each statement. They have been provided below, however, for reference purposes.

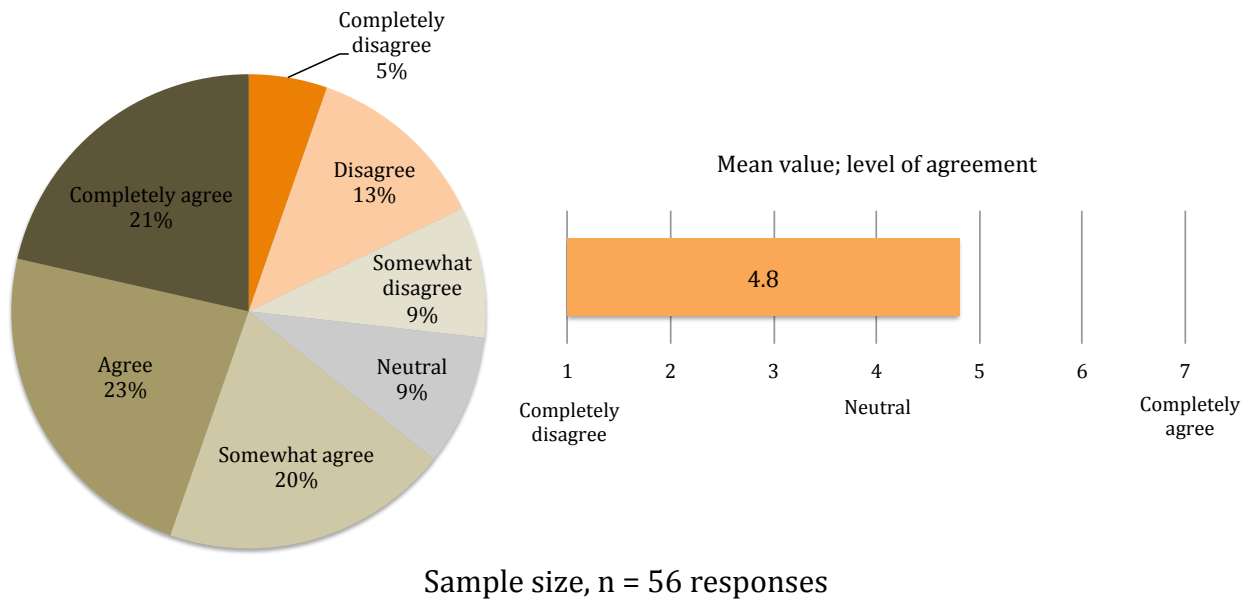
- 1) Employees' reactions to statements about the Bloch Building, Nelson-Atkins Museum of Art:

Statement 1: “For the art world, the addition, known as the Bloch Building, should reaffirm that art and architecture can happily coexist.” – Nicolai Ouroussoff, “A translucent and radiant partner with the past”, *The New York Times*, June 6, 2007, pp. E1-E5



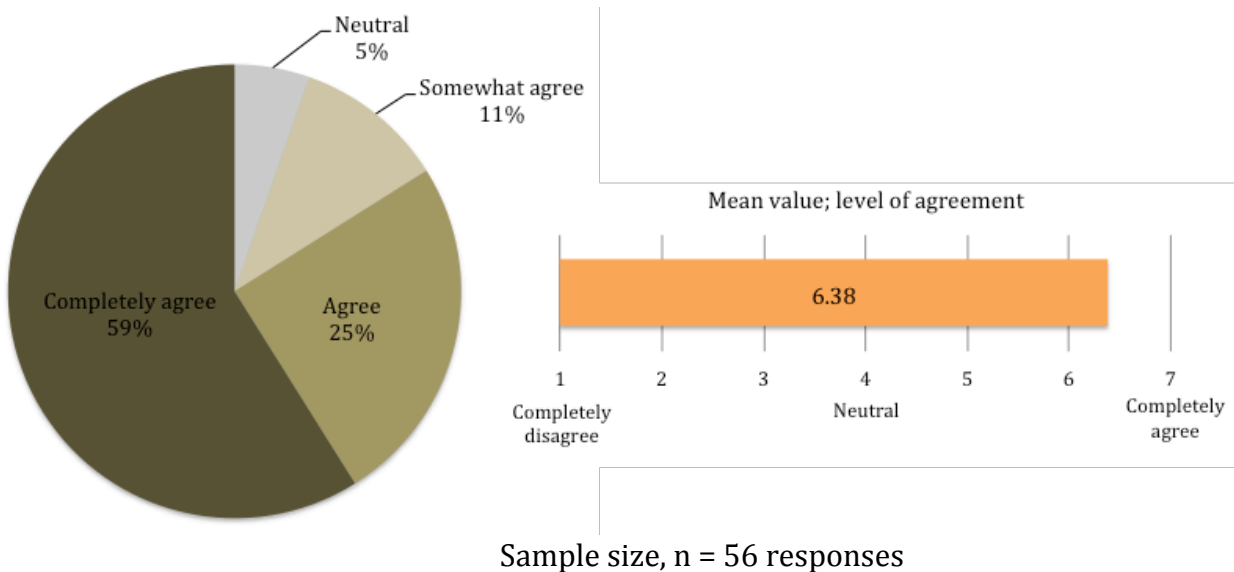
**Fig. 6.17 (Left):** Employees’ levels of agreement with statement 1 and **Fig 6.18 (Right):** Mean level of agreement of the respondent sample. Source: author.

Statement 2: “With multiple levels woven around a constantly changing topography, the Bloch Building, as the new structure is called, is highly complex.” – Paul Goldberger, “Lenses on the lawn, Steven Holl re-thinks the museum-extension genre”. *The New Yorker*, April 30, 2007, p. 86



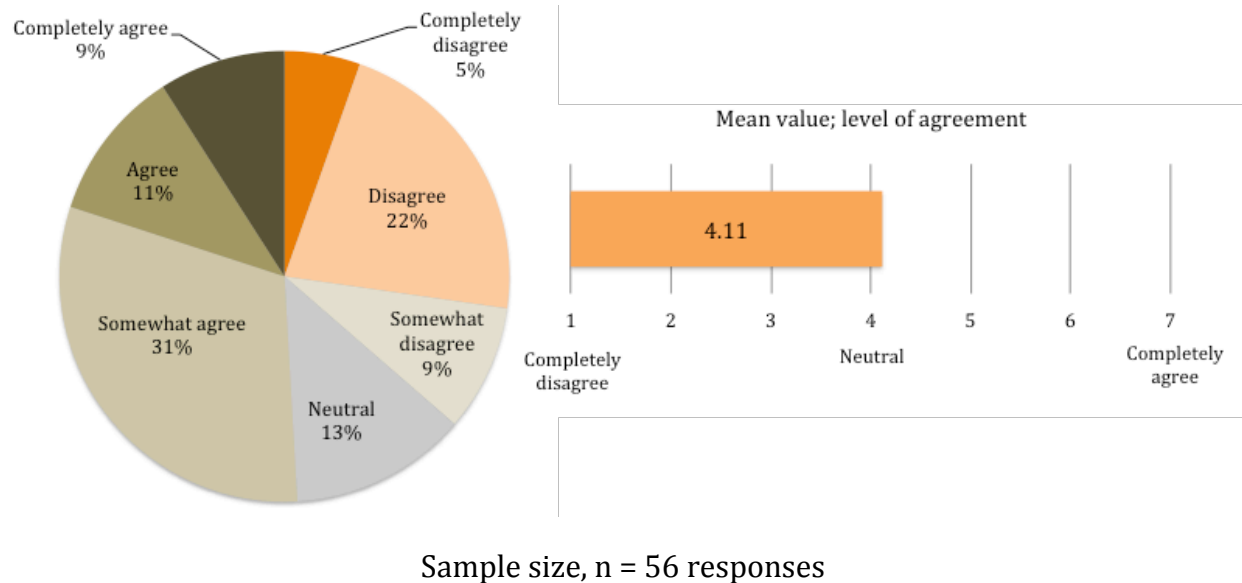
**Fig. 6.19 (Left):** Employees' levels of agreement with statement 2 and **Fig 6.20 (Right):** Mean level of agreement of the respondent sample. Source: author.

Statement 3: "...throughout the Bloch Building he(Holl) treats light as if it were a building material in itself. Illumination from the clerestory windows, as well as from sections of translucent glass wall, diffuses gently through the galleries...producing an interior of cool, even light."- Paul Goldberger, *"Building Up and Tearing Down: Reflections on the Age of Architecture"*, 2009, p. 266



**Fig. 6.21 (Left):** Employees' levels of agreement with statement 3 and **Fig 6.22 (Right):** Mean level of agreement of the respondent sample. Source: author.

Statement 4: “the lenses...lose some of their magical quality in bright sunlight, when translucent glass has less depth and mystery and can seem like hard plastic” - Paul Goldberger, “Lenses on the lawn, Steven Holl re-thinks the museum-extension genre”. *The New Yorker*, April 30, 2007, p. 86



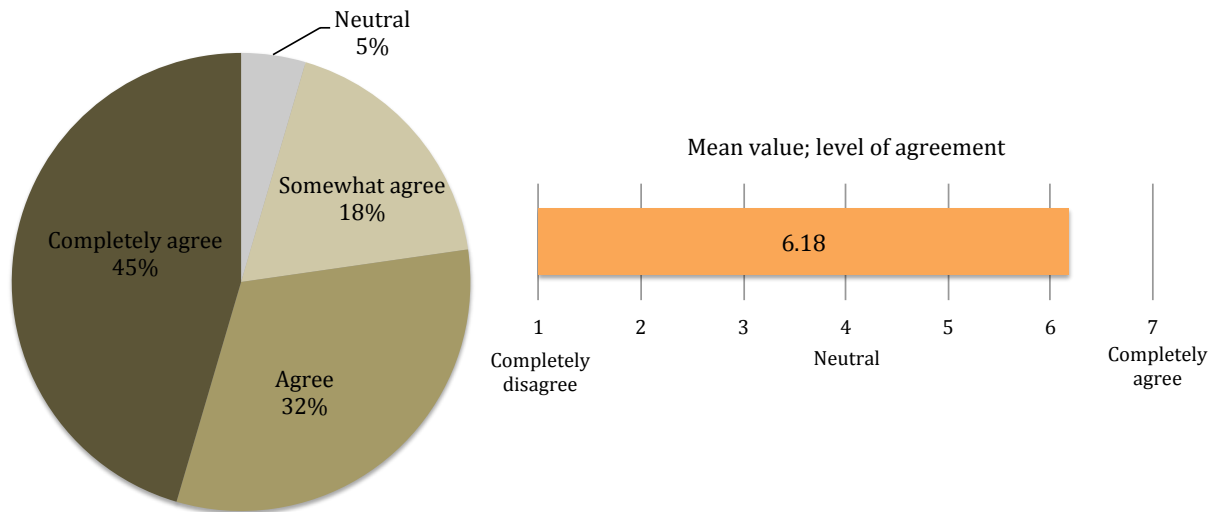
**Fig. 6.23 (Left):** Employees' levels of agreement with statement 4 and **Fig 6.24 (Right):** Mean level of agreement of the respondent sample

Employees almost completely agreed with critics' positive statement 1 and agreed with statement 3 about the Nelson-Atkins Museum addition as per the mean values of 6.54 and 6.38 indicated in figures 6.16 and 6.20 above. A large percentage of respondents: 64% and 59% completely agreed with statements 1 and 3 as shown in figures 6.17 and 6.21.

Negative opinions about the addition expressed by statements 2 and 4 on the other hand, received lukewarm reactions from employees; as per both mean values of 4.8 and 4.11 shown in figures 6.20 and 6.24 respectively, indicating that they only somewhat agreed with or took a neutral stance towards these opinions. They somewhat agreed that the Bloch Building was a complex structure but still felt that it was a great building for housing art that stood out for its architectural design features.

2) Employees' reactions to reviews on the Phoenix Art Museum additions (1996 and 2006):

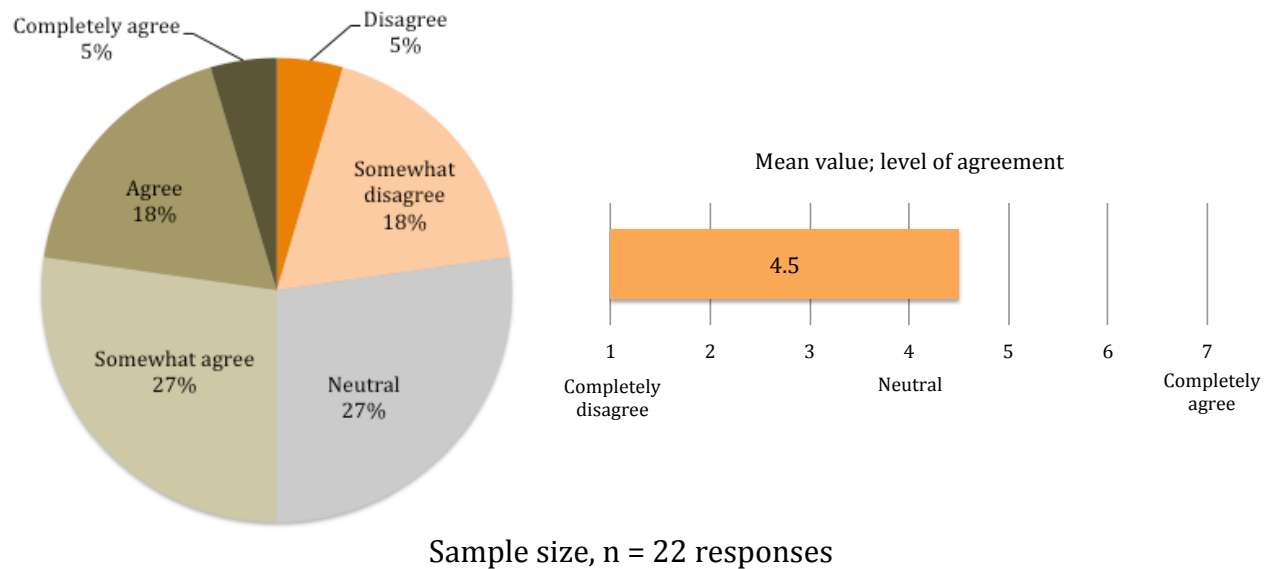
Statement 1: "The (2006) expansion is characterized by innovative design and detailed craftsmanship." – Staff person in the Southwest Contractor, "Phoenix Art Museum; Editor's Choice: Renovation/Restoration", *Southwest Contractor*, December 1, 2007, p. 69



Sample size, n = 22 responses

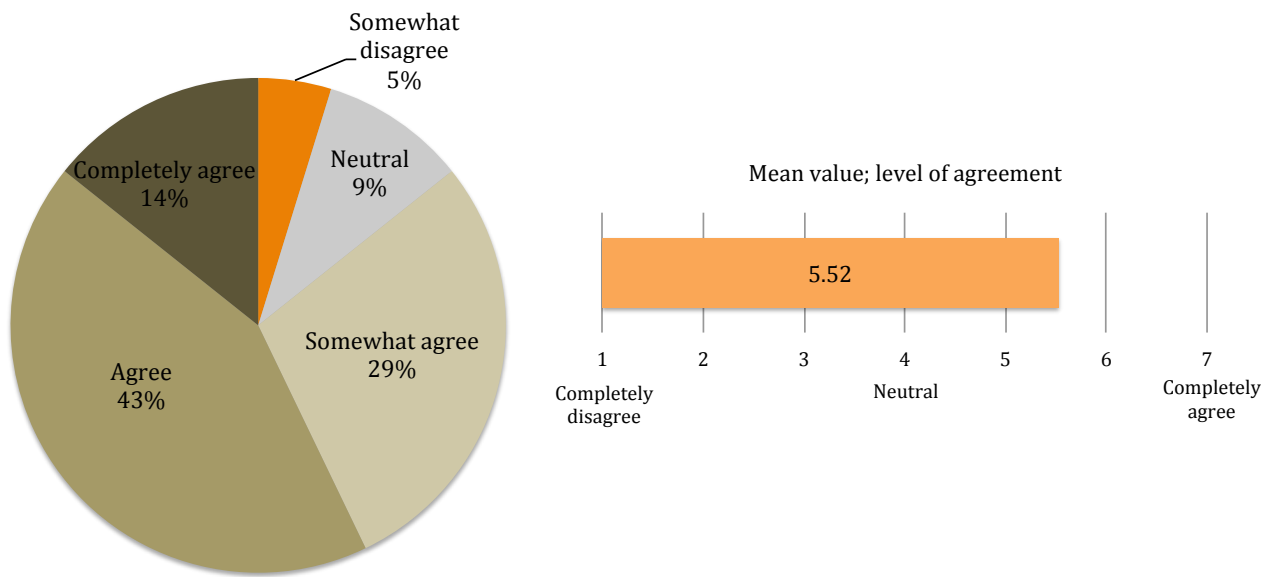
**Fig. 6.25 (Left):** Employees' levels of agreement with statement 1 and **Fig 6.26 (Right):** Mean level of agreement of the respondent sample

Statement 2: “It's as if the institutional art world has adapted the old swim-or-die superstition about sharks: keep building or become irrelevant.” – Randy Kennedy, “Art in storage and money to burn, museums are stretching the walls”. *The New York Times*, December 24, 2006, p. 36



**Fig. 6.27 (Left):** Employees’ levels of agreement with statement 2 and **Fig 6.28 (Right):** Mean level of agreement of the respondent sample

Statement 3: “Williams and Tsien have a very refined sense of incident. Their ability to produce such complex movement within a project of relatively modest scale is by use of a canny, elegant plan and by beautifully developed events en route -- landing sites and overlooks, changes in color and materiality, flashes of light through apertures ranging from windows to glazed form-tie holes.” – Michael Sorkin, “Criticism: Can Williams and Tsien's Phoenix Art Museum help this sprawling desert city find its edge?”, *Architectural Record*, January, 1997, p. 88

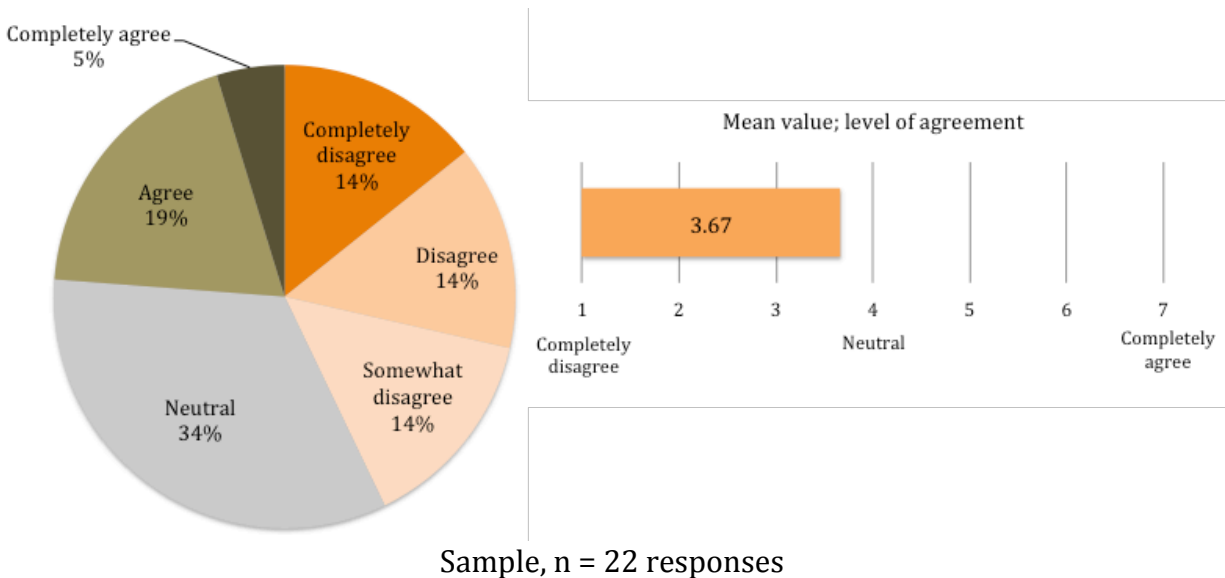


Sample size, n = 22 responses

**Fig. 6.29 (Left):** Employees' levels of agreement with statement 3 and **Fig 6.30 (Right):** Mean level of agreement of the respondent sample

Statement 4: "At a time when schools are deteriorating, roads are crumbling, and low-income housing is woefully underfunded, one can't help but question the vast sums being spent on new museums...but the extravagance is certainly good for the art of architecture and for the few architects who get the chance to build museums." – Jayne Merkel, "The museum as artifact", *Wilson Quarterly*, 2002, p. 80





**Fig. 6.31 (Left):** Employees' levels of agreement with statement 4 and **Fig 6.32 (Right):** Mean level of agreement of the respondent sample

Employees agreed with statement 1 that noted two positive characteristics of the 2006 museum expansion. This was indicated by the mean value of their selections; 6.18, shown in figure 6.26 above. They also agreed with statement 3, praising some of the museum architects' design decisions—indicated by a mean value of 5.52 in figure 6.30. The mean value of 4.5 in figure 6.28 on the other hand, indicates that they only somewhat agreed with or were neutral towards the negative comment in statement 2 pertaining to the trend of building new additions by the art institutional world. Similarly, they somewhat disagreed with or were neutral towards statement 4 indicated by the mean value of 3.67 in figure 6.32 above. We can conclude that Phoenix Art Museum employees reacted similarly to Nelson-Atkins Museum of Art employees in response to critics' reviews.

### **Summary of key findings from the museum employee survey:**

The 75 employees who responded to the survey had a wide variety of job descriptions, ranging from directors and curators to museum store clerks and security guards. The

sample of survey respondents: 75 of 285 employees who were sent the survey; a 26.32% response rate, therefore, was found to be a good representative of the museum workforce at the Nelson-Atkins and Phoenix Art Museums. Here is a summary of the key findings from the results of the survey:

**1. Most employees' surveyed reported dissatisfaction with their working**

**conditions.** A majority of employees did not have windows in their work space. For the ones that did have some sort of opening to the outside (window/door/skylight), the openings were found to be large - 80 square feet on average, and facing south or north more than east or west. Size and orientation of openings, however, were only secondary considerations for employees; having a window of any size and orientation was better than having none at all. Most employees, in fact, found any work space with daylight and windows to be the best one they could possibly get. Respondents expressed a preference for private offices over open areas with cubicles or separate desks, but the main criterion for a work spaces to be the best for most employees, was having a desk near a window. Similarly, work spaces that were windowless, especially those in basements without a window were found to be the worst ones. Satisfaction levels were also found to be linked to the ability to control light. Most employees had the ability to control electrical light (68%) while few had the ability to control daylight (28%) and few did not have the ability to control light—daylight or electrical or both, at all.

**2. New museum additions did not improve working conditions for museum**

**employees at both museums.** Many employees continued working in the same space even after the new addition, and those were moved from the older museum

building to the new one were mostly moved to basements and/or windowless spaces. Some unfortunate individuals were moved from prime spots on the top floor of the older building to the basement of the new one or from spaces that received natural light, to windowless rooms. One of the few exceptions was an executive suite, meeting rooms, and event rooms that were planned and built in a new museum wing; that were flooded with natural light with extensive views of the museum campus and neighborhood through windows or glazed walls. These rooms, as their names suggest, were reserved only for important people and important events.

3. **Employees found their own plus fellow employees' work spaces –the backspaces of the museum to be worse than the public areas—the front spaces of the museum**, due to the lack of daylight and views, location (basements), lack of privacy and some other conditions discussed in detail in the survey results.
4. **Daylight and views to the outside were found to be recurring themes in most response categories that were descriptive in nature, i.e. requiring text responses.** Most employees felt that daylight and views in work spaces were desirable, just as much as they were in the public parts of the museum.
5. **Art galleries in the older museum building were often ignored and not upgraded along with the new addition project.** And very often, these very art galleries contained most of the museums' permanent collection and major works of art. Museum employees rated art galleries in the older building along with circulation areas (in both the older building and the new addition) as being the worst spaces in the public part of the museum. The reasons why they got left behind

are manifold as discussed earlier—museums find it easier to find funding for a new architectural masterpiece rather than the renovation of old art galleries, museum directors and trustees like to leave a strong legacy, donors like to have their names on plaques or entire buildings named after them, and these new buildings also represent prime commissions for ‘starchitects’—an opportunity to do something spectacular.

6. **Employees stood up for the museum addition in the face of critics’ negative reviews on average, and agreed with their positive reviews.** This may be due to pride in the new museum building, art institution that they worked for, the community, and their jobs. Perhaps they also felt that critics went overboard in their criticisms of the new building and didn’t get the reasons why certain decisions were made; critics lacked an insider’s perspective in their assessments. Findings from the survey also tell us that on average, they also felt satisfied the overall addition building(s), and they felt that fellow employees and visitors were satisfied with it too. When questioned about specifics, however, they identified a number of environmental attributes that would they would change or improve upon in the building, missed opportunities in the museum, and other areas of concern.

The next section will build upon these key findings by discussing specific issues revealed via on-site observations in the four selected case studies. What works and what doesn’t work? And what are the possible reasons? We will also gain further insight on museum additions from on-site interviews with a range of museum employees consisting of directors, curators, exhibition designers, gallery docents, and security managers.

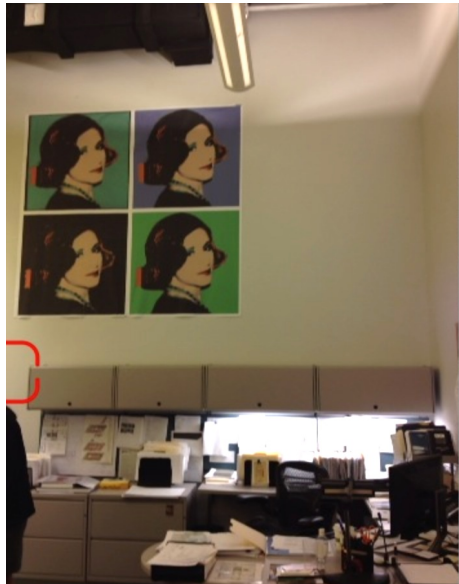
### **Part 3: On-site observations and interviews: Discussions on back stage spaces and front stage spaces**

On-site observations were made only in public (front stage) parts of the Art Institute of Chicago and the Metropolitan Museum of Art, New York and in both the public and employee (front stage and back stage) spaces in the Nelson-Atkins Museum of Art, Kansas City and the Phoenix Art Museum. Selected personnel at the latter two museums were also interviewed in person and on-site, as per the summary in table 6.1. In addition to these interviews, there were some conversations with security guards and volunteers who approached the author voluntarily in order to ask questions out of curiosity, and discuss certain issues that stood out to them in the museum. The discussion in this section first addresses behind-the-scenes issues in museum back spaces, and then moves to the front spaces; the public, visitor areas of the museum.

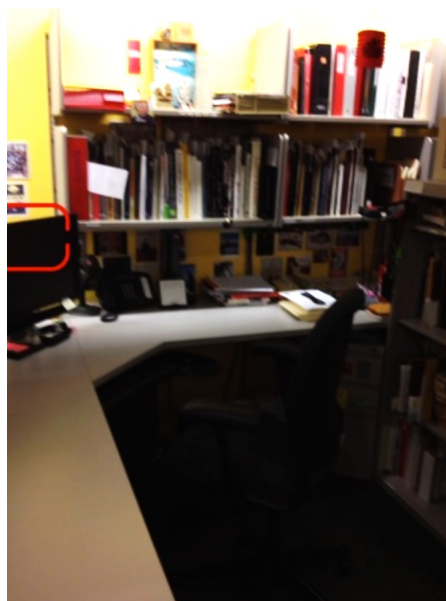
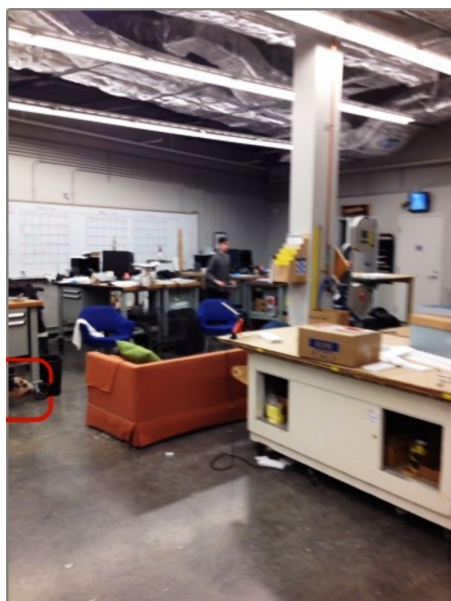
#### **Museum back stage spaces: Artwork before people**

The observation of museum back stage spaces revealed a large and diverse group of people, performing specific functions in a myriad of interior environments, ranging from administration offices, library stacks, art preparation areas, imaging labs, conservation labs, to art stacks and storage, amongst many others. Observations in these spaces and interviews of individuals who worked in them, aligned with survey responses; most of the employees working in the non-public parts of the museum, were not benefitted by the new addition in any way. In the Nelson-Atkins Museum, they were located in the lower level of the older Nelson-Atkins building or in the basement of its new 2007 addition; the Bloch building, commonly referred to by the museum workforce as the 'B-level'. Some of the

offices in the lower level of the older building received some natural light coming through a light well outside, however, the B-level rooms in the Bloch building addition were all windowless as shown in figures 6.33 through 6.36 below.



**Fig. 6.33 (left):** Conservator's office and **Fig. 6.34 (right):** Registration office in the B-level, Bloch Building, Nelson-Atkins Museum. Images source: author.



**Fig. 6.35 (left):** Art prep area and **Fig. 6.36 (right):** Visitor Services offices in the B-level, Bloch Building, Nelson-Atkins Museum. Images source: author.

How did this come to be? The art institution, represented by a board of trustees and spearheaded by the museum director, had a clear vision that the new addition was for art, over and above anything else, according to employees. These decision-makers appeared to make a clear distinction between the private backspace and the public frontspace of the museum when planning new museum additions—almost as separate projects. “We understood that artwork always comes before people.”, said an employee at Phoenix Art.

Most employees at the Phoenix Art Museum continued working in spaces that were only subject to piecemeal repairs and renovations over the years and were not moved into the new addition at all. A handful of spaces just kept getting retrofitted for different functions over the years—two of them are shown in figures 6.37 and 6.38 below. “[My] workspace was a utility closet before I came to the museum. The director wanted to build the visitor services department. [So] they put a desk and a computer in the closet.”, said an employee.



**Fig. 6.37 (left):** Security Manager's office in the Phoenix Arts Museum. Image source: author. **Fig. 6.38 (right):** Visitor Services offices in the Phoenix Arts Museum. Image source: author.

Sometimes, the resistance appeared to come from employees slightly lower down the ranks, for different reasons such as inconvenience and a refusal to adapt and change.

“The Chief Curator is against moving—[he] wants us to stay together and stay near Education.”, said one curator. “There was supposed to be one more lens, but it got value-engineered—and it was to have more office space”, said another curator. “I have no windows [in my office], but I spend majority of my time in the administration building, checking galleries and having face-time with staff.”, said one security supervisor.

New additions create more employees with a need for more work space—a cyclical pattern that occurs in all museums as they expand and something which they are finding increasingly difficult to ignore. “Now we are struggling with the need for more storage space and office space because of more program”, said the Director of Administration at one of the museums.

Not all the employee work spaces in the new building addition, however, are in windowless basements. The executive office suite with the Chief Operating Officer's office in the Bloch building of the Nelson-Atkins is located on the second floor in a corner, with views looking towards west, north, and east at the surrounding museum and neighborhood, and flooded with natural light from the east and north (figure 6.39). The library is on the same level, next to the translucent, glazed wall providing diffused daylight from the east. The Rockhill Room—a large meeting room, and a large event space are in prime locations; on the top floors of the Bloch building, with views of the museum campus and the city beyond (figure 6.40).





**Fig. 6.39 (left):** COO'S office in the Executive suite, and **Fig. 6.40 (right):** The Rockhill meeting room, second floor, Bloch Building, Nelson-Atkins Museum. Image source: author.

We can see from the types of rooms their locations, a systematic hierarchical order in the way these spaces are assigned and planned. The library with its reading room as shown in figure 6.41 below, is filled with natural light; an area that has been carefully curated for visitors, just like an art gallery. Most of the library support staff, are in the basement with the book stacks. Special consideration may also have been given to creating a library in the new Bloch building, I was told by one employee, because the previous museum director's (Marc Wilson, under whose leadership the Bloch building was built) mother was a librarian.

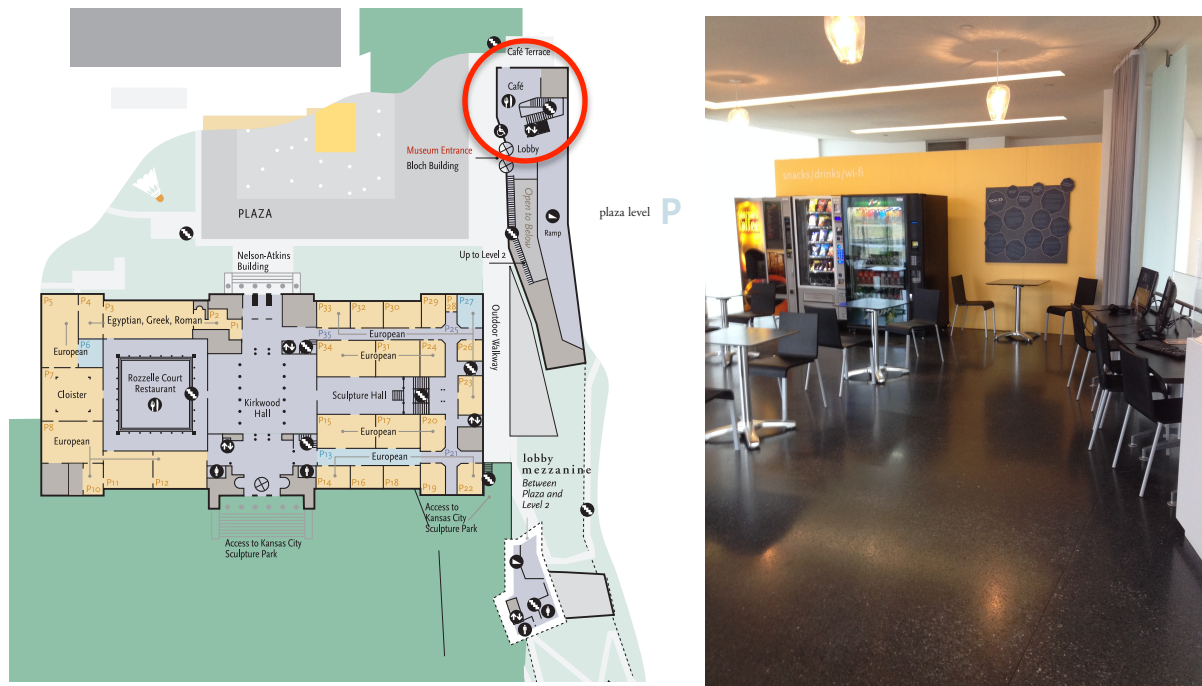


**Fig. 6.41:** Library, second floor Bloch Building, Nelson-Atkins Museum. Image source: author.

Some museum representatives may argue that there is not enough space to put all employees above the ground. This argument, however, is flawed, primarily because in the creation of a new museum addition building, essentially, new work spaces can be accounted for in the early fund-raising and programming phases. In the case of the Bloch Building, new work spaces were actually designed and money was spent in constructing them—except for the fact that *a majority of them were put in the basement*.

Careful planning may potentially, also help eliminate wasted, unprogrammed spaces or put them to better use. The Creative Cafe, situated at the end of the museum next to the plaza level entrance for example, is essentially a wasted space, as per observations, and employee feedback. Located in an optimal corner of the building with fantastic views of the museum plaza and campus on the north (see figure 6.42 next page), it is a space filled with unused tables and chairs, three vending machines at the back, and three informational computers for the public. In the span of six consecutive days other than two security guards

taking a short break, not a single visitor was observed using that space (see figure 6.43 below).



**Fig. 6.42 (left):** Partial Plaza level plan showing the location of the Creative Café in the Bloch Building, Nelson-Atkins Museum. Image source: Nelson-Atkins Museum visitor map with infographics by author. **Fig. 6.43 (right):** Inside the Creative Café in the Bloch Building, Nelson-Atkins Museum. Image source: author.

The underutilization of this space exposes flaws in the early stages of the new buildings programming processes and perhaps also some disagreements amongst decision-makers.

As per the Director of Administration, Nelson-Atkins Museum:

[The] café is a total waste. The museum had a different vision for the café. One million visitors never materialized [as we had hoped]. We had about 453,000 [visitors] the first year.

The Creative Café issue reveals that the argument of not having enough room to put museum employees above ground does not hold. If there is room for unprogrammed,

unplanned space, then there can be room for museum staff offices!

On top of it all, when a new building program is cut due to budgetary reasons, the employee spaces are the first ones to go, as it was in the case of the Bloch Building on the Nelson-Atkins campus when “Lens 1” was completely nixed from the program as per one museum curator. The study of backspaces revealed that art came before employees in both museums.

Frontspaces of museum additions were also studied on site via observations and interviews and they are discussed next.

### **Museum front stage spaces: The “Frankenstein effect of museum additions”**

Museum additions, generated mixed reactions by visitors and local community initially and sometimes they still do. “This building is awful,” said one visitor in the group of seven which included the author, led by a docent in the Bloch Building. “I prefer the older building.”

“This is a typical reaction from older visitors who are local residents,” said the docent (a volunteer tour guide) afterwards. “That’s why I prefer educational tours or leading groups of children who are enthusiastic and willing to learn.” The Bloch building met with a lot of resistance even when it was under construction, according to the many conversations with museum volunteers. Residents detested the dirt that was piled on the site to create the hilly landscape, the removal of trees on the east side and the overall look of the “lens” structures, which many said looked like a “Butler house”—a Midwestern term used to describe a prefabricated metal barn in a farm (as explained by a volunteer). Architect Steven Holl at

the Town Hall meeting persuaded the attendees to wait until the building was ready, and then to look at how the building lenses looked in the night, when the glass walls were lit up. Now it appears that except for the occasional rumblings of discontent and noises of disapproval, acceptance has come with time; residents, by and large, are proud of the new Nelson-Atkins and the way it has put their city on the international map. The “Shuttlecock” sculptures in its outdoor lawn by artists Claes Oldenburg and Coosje van Bruggen (shown in figure 6.44 below) though controversial and much criticized by the media when they were installed, are now *iconic* for Kansas City, said the Director of Administration at the Nelson-Atkins Museum.



**Fig. 6.44:** “Shuttlecocks” by Claes Oldenburg and Coosje van Bruggen on the sculpture garden , Nelson-Atkins Museum of Art. Image source: Nelson-Atkins Museum visitor map with infographics by author.

In Phoenix, additions to the Art Museum were received positively too. According to one

curator at Phoenix Art Museum:

Once the Katz Wing and the new [Greenbaum] lobby were completed, it was felt that 'we finally have a big city museum', and the overall response was absolutely positive. The economy crashed shortly after we opened these new spaces. But the psychological motive for funding/gifting new works increased. When this was a small regional museum, people who moved here [to Phoenix] from colder places left their art back home. They don't do so much of that now.

One employee also said that the 1996 addition allowed the Phoenix Art Museum to become a player alongside some of the bigger museums. Earlier, they used to get most of their artwork on loans from other museums such as the Getty in Los Angeles, California. "Two or three big security guys would throw a Monet or a Rembrandt at the back of a truck and would drive it here in the middle of the night", he said.

We see that change was met with some resistance initially but mostly with acceptance later on by the community upon completion of the new building, however, not everything worked according to plan. Observations at all four museums supplemented by the inside information gleaned from staff interviews at two museums, revealed that public spaces in all four museums were beset with problems of accessibility, wayfinding, and connectivity.

### **Accessibility**

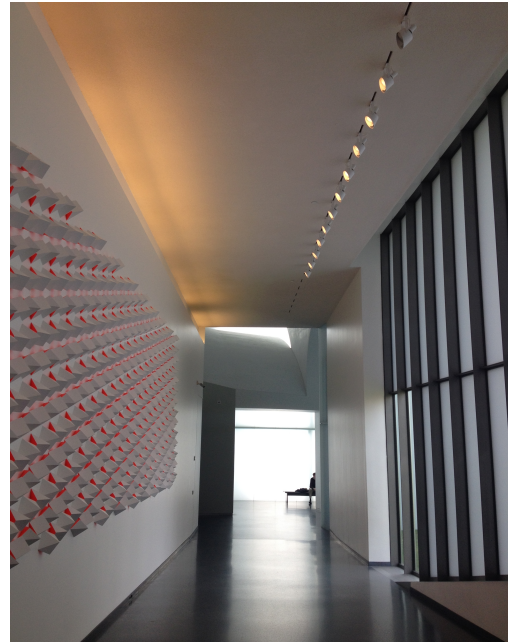
"Getting to the meeting room is awkward", said one curator in the Nelson-Atkins Museum, "...and you can quote me on this. Instead of being direct, it is a zigzag route". "However, we don't mind doing the quarter mile walk several times a day", she said, referring to the act of walking the entire length of the Bloch Building, which many employees perceived to be a quarter mile (it is actually about 0.16 miles, as discussed later). The terms used for different floor levels in the new and older buildings are also confusing. In conversations,

employees used many different terms—such as “Plaza level”, “Lobby level”, “Basement level”, “Lower Floor level” and “B-level”. At one instance, when a curator asked employees on which floor we were, they gave us a puzzled look and said “We don’t know”.

This is interesting, especially for those individuals who work there. With the built up site around the lens, there is a perpetual ramp in the basement as well as the upper, gallery levels (known as the “gallery walk”) created by the need of navigating an upward slope (while walking north) or downward slope (while walking south), a movement which effectively eliminates a clear idea of separate, stacked floor plans.

The museum website describes this change in levels as follows: “The galleries’ floors drop in harmony with the slope of the south lawn. In opposition, as each gallery level steps down, the ceiling of that level peaks into a glass-enclosed lens that rises above the ground level.” (Nelson-Atkins Museum), however, these level changes have created a ramp that has given rise to accessibility issues and fatigue in visitors. Some of the older volunteers had to retire since they could not navigate this walk, according to one docent. Ultimately, in order to accommodate children, seniors, and people with disabilities, the museum had to provide golf carts (with funding from donors) to ferry visitors back and forth across the length of the Bloch Building. The museum advertises this gallery walk shown in figures 6.45 and 6.46 below, as a key feature rather than address it as a problem. One advertising brochure states that going across the length of the Bloch building is equivalent to traversing a building that is 67 stories tall—a fact that is often repeated by the museum employees. Beneath the temporary fixes and attempts to reduce the problems created by the ramp (with golf carts, etc.), however, is a reluctant acknowledgement of the fact that it does not work.





**Fig. 6.45 (left):** Lower level plan showing the location of the gallery walk (with a dashed line) in the Bloch Building, Nelson-Atkins Museum. Image source: Nelson-Atkins Museum visitor map with infographics by author. **Fig. 6.46 (right):** The gallery walk in the Bloch Building, Nelson-Atkins Museum. Image source: author.

The Bloch Building is about 840 feet long (0.16 miles) (Kipnis, Halbe, and Holl, 2007).

Approximate measurements from site and scaled drawings in published literature on the Bloch Building (Kipnis et al, 2007) revealed that the gallery walk, is about 450 feet long (0.09 miles), with a slope ranging from about 4-4.5%, within the ADA prescribed requirement of 5% (a 1:20 feet ratio) (ADA, 2010). One employee of the Nelson-Atkins Museum said:

The long gallery walk to the featured exhibition location is aligned with ADA requirements but does not work for mobility challenged people - especially in the



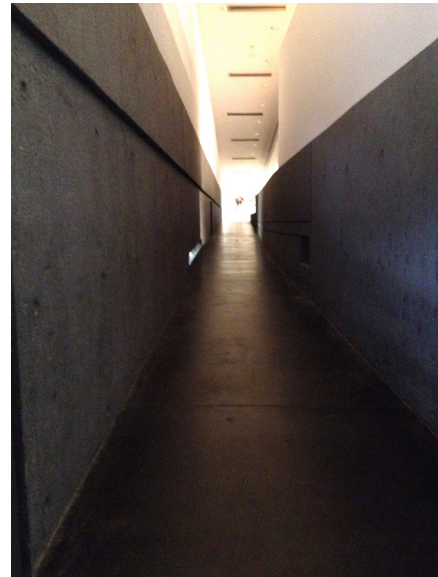
uphill return to the lobby. We added Shuttlecarts (golf carts) to address that matter. We are now looking to remove it or change its design to be less barrier-like and much more interactive.

“Who wants to use a golf cart?”, said Carl Lewis, Visiting Assistant Professor in the Architecture school in the University of Illinois at Urbana-Champaign when asked for his opinion. He is an expert on ADA issues who also worked for eight years on the presidential access board of USA’s former President Bill Clinton, and most notably, is a wheelchair user himself. Carl Lewis also pointed out:

Laws are made for individuals with disabilities to help themselves...I couldn’t use a golf cart myself because my shoulders are weak. Legal troubles come with people helping people...The first thing that I look for is an elevator. Ramps (especially long ones) don’t work. They are made for going down. Experiential attempts are ok, but there needs to be an alternate circulation outside.

In Phoenix Art Museum, similarly, along the western edge of the museum in South Wing, connecting the Mezzanine level to the Great Hall is a very long ramp, approximately provided for accessibility, that begins in an awkward corner near the entrance for the Whitman Theatre. This ramp, as per approximate measurements on site, is about 110 feet long in each direction, a total of 220 feet in length with a slope of about 8% (a 1:12 feet ratio), in line with ADA guidelines which also recommend a minimum of 1:12 feet ratio for ramps (ADA, 2010). The walls on the sides of this ramp have many openings; almost every one of them is a different size or shape, and retrofitted awkwardly with glass so that they are not dangerous, especially for children who may be able to squeeze through. It was built in 1996 in order to lead to an amphitheater at the corner of the mezzanine level, as explained by a curator. There was no money at that time, to buy a separate elevator to go up. The amphitheater, now, is not used for performances, but as a small art gallery or even

a storage space at times, and the long ramp (shown in figures 6.47 and 6.48 below) is seldom used. The museum, unfortunately, chose not to remove it and improve this space as part of the 2006 addition project.



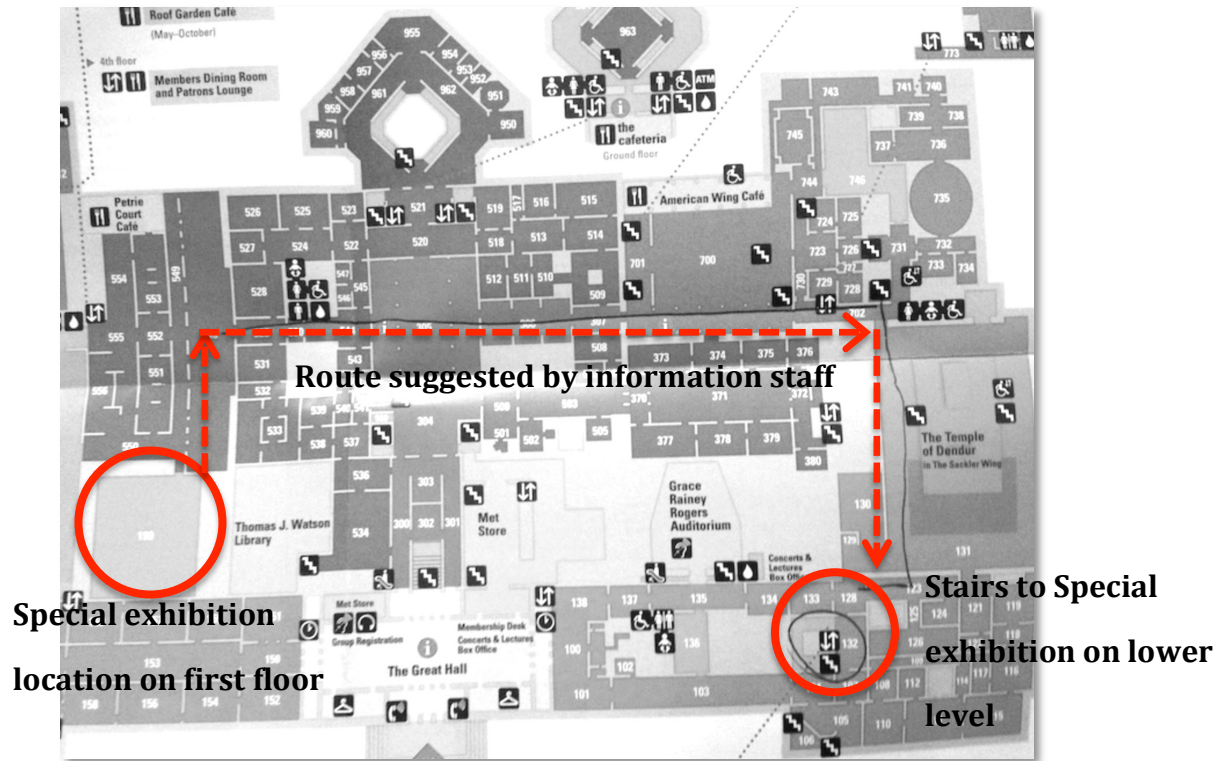
**Fig. 6.47 (left):** Main level plan showing the location of the gallery walk(with a dashed line) in the Phoenix Art Museum. Image source: Phoenix Art Museum visitor map with infographics by author. **Fig. 6.48 (right):** The ramp between the Great Hall and Mezzanine level in the Phoenix Art Museum. Image source: author.

In the Art Institute, there are ADA ramps at level changes throughout the museum for accessibility but they seem to be afterthoughts that are not a good fit for the spaces at all. In

some cases they are off to the side of small, narrow galleries. One side of the ramp between Gunsaulus Hall was sealed off by the museum without any notice as to when it would be reopened for visitors. The Met has a similar situation; all spaces appeared to be accessible, but it was hard to imagine someone in a wheelchair trying to navigate two million square feet of museum space through the maze of galleries, narrow entrances, and hallways even they were all technically, accessible. No wheelchair-bound visitors were in fact, observed, even once, in any of the ten days of field visits in the Met. Also, no previous studies on accessibility in the Met were found when conducting a literature review on the subject.

### **Wayfinding: Navigating “a giant complicated maze”**

An information desk attendant at the Metropolitan Museum of Art drew some lines on a museum map shown in figure 6.48 below, when she was asked for directions to the special exhibition in the museum at that time - “Charles James: Beyond Fashion” by the costume institute. The only way to get to this exhibition, as shown in figure 6.49, was by taking a circuitous route through almost the entire length of the building which spans four New York City blocks.



**Fig. 6.49:** First floor plan showing the route the special exhibition in the lower level at the Metropolitan Museum of Art. Image source: Met visitor map with infographics by author.

The first floor exhibit was accessed through the Greek and Roman Art Galleries, and the exhibition continued into the ground floor galleries, which were not connected internally but needed to be accessed through an elevator/stairs from the Egyptian Art galleries on the other end (Northeast corner) of the museum. To get to it from the Petrie Court after exiting the first floor exhibit, one would need to walk through European Sculpture and Decorative Arts, through the Medieval Art Court in the center, two other Medieval Art galleries, the American Wing, take a right and walk through the Temple of Dendur, take another right and walk through two more Egyptian galleries, and go down two flights of stairs. This was the route for the much-advertised, blockbuster exhibition of the museum at the time of observation, which described only one instance of the many confusing connections and wayfinding problems at the Met; a museum that has become *a giant complicated maze* after

its many additions over the years. One becomes acutely aware of these connectivity issues after moving through spaces inside each wing as well as in-between wings.

The only way to get to a particular work of art in a particular gallery at the Met, is by reading the museum map very carefully and keeping track of gallery numbers while walking. If one wanted to wander through the building without a specific purpose, the museum may work just fine, but if the goal was to look at a specific art installation, it would probably be through some trial and error. The maps help, but why not highlight the connections and make them easier to read? Better still; provide good signage on the walls or hanging from the ceiling like they have in airports. At two million square feet, the museum is larger than many airport terminals.

In the Wallace Wing with modern and contemporary art, access to the third floor galleries was cut off from the second floor galleries because some of the galleries were closed to the public. One had to go back to the first floor and take an elevator to the third floor to get to those spaces. Access to the roof garden installation was even worse, if not dangerous for the public. One had to take an elevator to the fourth floor and walk up a narrow flight of stairs to get up to the roof garden. And this was the only stair open to the public—the second stair and elevator going up to the roof was closed to the public—essentially making it not only a safety hazard but also inaccessible to those on wheelchairs at the time of the visit.

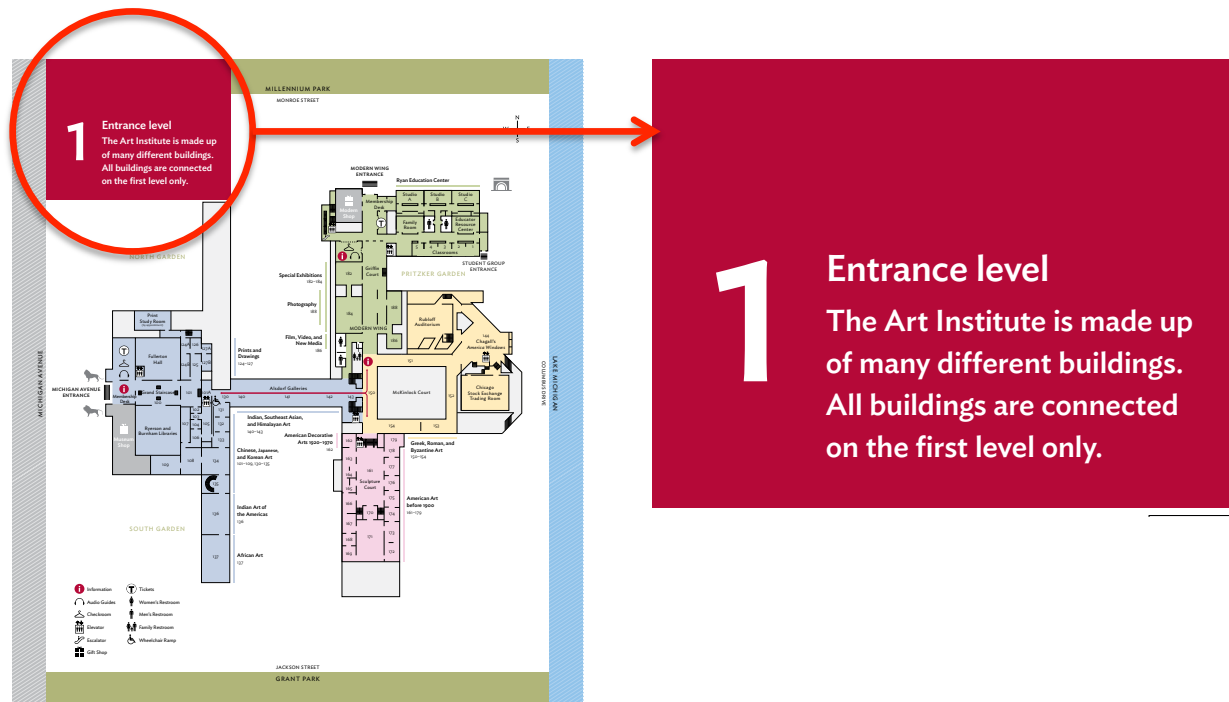
The American Wing with three floors had a glass elevator connecting all three floors vertically. The third floor was small, with American period rooms—beautifully arranged and displayed but almost completely void of visitors—possibly because it took too much

effort to get to them. The glass elevator was hydraulic, slow, and kept busy running between the first and second floors, which were more popular with the visitors.

The connections between wings appeared to be even more haphazard, cramped, and confusing than the ones inside wings. There were no means to orient oneself—instead of a central circulation element such as an atrium connecting every wing, there were a number of smaller courtyards within each wing such as the recreated medieval castle within the European galleries on the southeast, the Chinese garden courtyard on the second floor in the Asian galleries or the Charles Engelhard sculpture court in the American Wing. The restrooms were also located off certain galleries in each wing; there was no central lobby or central location where they could be found. If one had to use a restroom after entering the museum in the Great Hall, to get to the nearest one, one would need to walk a route through the Egyptian galleries, in-between Pharaohs and sarcophagi in order to use a restroom in the Egyptian wing.

In the Art Institute of Chicago, all the different museum wings were connected only at the first floor level (as announced in the visitor map shown in figure 6.50 below) forcing one to walk through the Alsdorf galleries in the Gunsaulus Hall and around the McKinlock Court at the upper level on the first floor. This route was the only way for visitors to get into the Rubloff Building with “Chagall’s America Windows” exhibit and the Chicago Stock Exchange on the east, the Rice Building on the south. It was also the principal means of getting to the Modern Wing to the North, even though there was a small entrance connecting the second floor galleries above Gunsaulus Hall to the Architecture and Design gallery in the Modern, next to the Café on the second floor—a portal that could be found only by accidental

discovery at best. The first floor galleries, therefore, also became the main route for museum personnel to transport exhibition objects, museum furniture, and equipment on carts, as it was observed at many different times.



**Fig. 6.50:** Art institute visitor map with enlarged text on the right . Image source: Art Institute visitor map with infographics by author.

Museum additions in the Phoenix Arts Museum increased the space for displaying art for audiences—something that was urgently needed with its growing collection. One docent who has been volunteering at the museum for the last 8 years and had a background in journalism and art publishing revealed:

The 2006 addition increased the space and opportunities to display more types of art such as Latin American and along with it, an increase in funding from sources such as the Heard estate which has also funded other establishments in the city such as the Phoenix Theatre, Opera, and the Library.

An increase in space gave rise to an increase in connectivity and wayfinding issues for

visitors at this museum too. “The upper levels are currently not connected. Maybe a catwalk connecting them is a good solution”, said another gallery docent who briefly joined the conservation.

The museum plan is divided into a North Wing and the South Wing, connected with the Chase lobby at the center, a space which is no longer the main lobby entrance. One has to enter directly into the north Wing of the museum through the Greenbaum lobby, the main entrance to the museum after the 2006 addition. The North Wing houses all of its permanent collection, along with some changing exhibitions in the Lyon Gallery and special exhibitions in the Steele Gallery. The South Wing houses contemporary, modern art, and photography, exhibitions that change or rotate throughout the year.

Both wings, however, were connected only at the Main level, leading to much confusion among visitors. After going through the American, Western American, Spanish colonial, and European galleries on the upper level of the North Wing, one had to come down again to the main level, cross a big hall, and go back up the stairs, elevators, or ramp to the mezzanine level of the South Wing that houses modern art and fashion design, or to the upper level in the same wing that housed Contemporary Art and Photography.

The lower level in the South wing eastern corner also housed two galleries with contemporary artwork, however, these two galleries were not well-visited as per observations; perhaps visitors were not motivated to make the trip all the way to the back of the museum and then down to this floor.



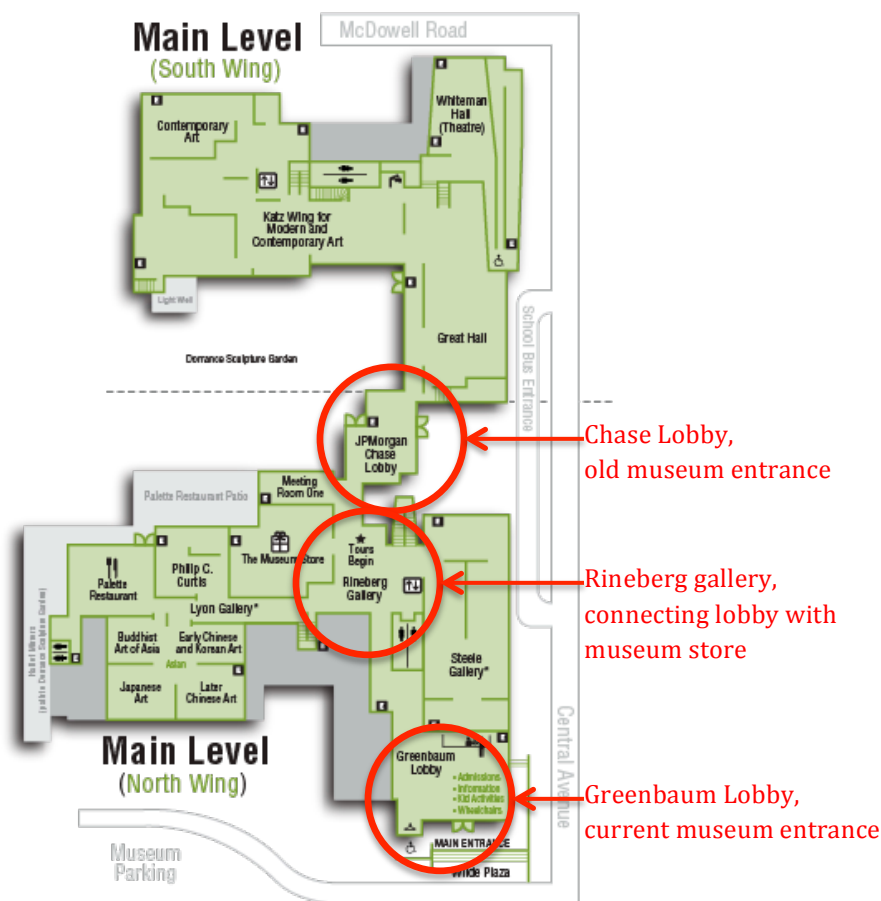
Sometimes, visitors also did not realize the true extent of the museum. “Very often, visitors think that the museum ends at the Great Hall and they start turning around, and we ask them to keep walking forward”, said an employee in visitor services.

This may also explain why my visitor counts in these two galleries were very low. Gallery visitation will be discussed in more detail later.

Another employee in Phoenix Art pointed out some areas of the museum that were part of the 1996/2006 additions and are now hardly used by the public. For instance, the feature staircase next to the Steele Gallery went mostly unnoticed by visitors who used the older staircase next to the Asian Galleries instead. The Steele Gallery also needed to be wider—least 15 feet wider in order to design its interiors more effectively for artwork, as per an exhibition designer in the museum. Visitors had no way to exit into another museum space after entering this gallery; they had to circle back and exit through the entrance, which he thought was a problem.

The current visitor entry sequence and circulation at Phoenix Art Museum, as revealed in an interview with a curator and also in conversations with security guards, was also problematic. The Chase lobby that was the older museum entrance before the new 2006 Greenbaum lobby was still very central to the museum layout because it formed the connecting piece between the North and South Wings. It was also located off Central Avenue, the arterial street along the western edge of the museum site. In addition, it was centrally located in the site with an open sculpture garden in the front. As a result, many visitors still tried to enter through Chase after parking their cars. Security supervisors then had to direct them to the Greenbaum lobby to the North since the Chase lobby had no

receiving desk or attendants and is now only used as an entrance for school groups. The Rineberg gallery—which is essentially a smaller lobby outside the museum store and lies between the Chase and Greenbaum lobbies—had no attendants either, save for an information desk with brochures and museum maps. Visitors need to walk to the receiving desk in Greenbaum, pay their entry fee and then go through the Rineberg and Chase lobbies again. The location of these lobbies are shown in figure 6.51 below.



**Fig. 6.51:** First floor plan showing the location of Chase lobby, Rineberg gallery, and Greenbaum lobby in the Phoenix Art Museum. Image source: Phoenix Art Museum visitor map with infographics by author.

One can see how these connections are problematic in the floor layout. One curator, employed at the museum for nine years, said:

If I were to change one thing in the museum, it would be the integration of the [Greenbaum] lobby with the Rineberg gallery and the Chase Lobby”, “People don’t stumble across much art before they travel a long way past the Great Hall...This is the result of the “Frankenstein Effect” of museum additions—just adding bits and pieces here and there.

Another staff member employed at the Phoenix Art Museum for the last 36 years also appeared to be well aware of the ongoing issues with visitor circulation and connectivity.

We haven’t had anyone studying visitor flow for a while. We are now trying to develop an information kiosk with maps and brochure with clear signs that say ‘I am here for...’. Several of the galleries have names such as the Steele Gallery and the Great Hall that have become identifiers over time but there are several galleries that don’t have these identifiers and become difficult [for visitors] to find.

Wayfinding problems in the museum also cause a lot of museum fatigue in visitors according to one visitor services employee in Phoenix Art. For instance, many restrooms were hard to find because of the signage and she had to add signs to make them easier to find. The museum map brochure also had great potential to improve graphically according to her, making it easier to read for visitors. The current museum map created confusion because of its color-coding and orientation besides other things, she explained. One employee complained that curators don’t see the show from the public perspective. “They see exhibitions the same way that they write labels—just for themselves”, he said. Museum graphics need to be really clear and be more visible than they were currently according to him.

### **Museum fatigue**

All interviewees were well aware of the symptoms of museum fatigue. They had experienced it themselves, or observed it in fellow employees and visitors that they talked

to on a regular basis. What measures did they, therefore take to help counter museum fatigue in themselves and in visitors?

One curator said:

[I] try to move part of the day, try to get sunlight, take the stairs, and take walks. Curators are luckier—they get to keep moving and don't sit in front of the computer all day. There is also interaction with other employees, plus team meetings.

One security guard at the Art Institute admitted that the job of a museum security guard was strenuous and at times, could get very boring. Whenever they changed the paintings or art in the room, it helped alleviate this boredom to some extent, he said. He worked from 10:30 am to 5:00 pm; the entire day that the museum was open, with two half- hour breaks in between. They also switched galleries with each other every half hour in order to alleviate boredom—a type of rotation that was in fact, observed in all four museums even though the time intervals varied (in Phoenix Art, they rotated every one hour). This helped them from getting stagnated by the same kind of artwork and being more attentive, said one security supervisor at the Phoenix Art. Supervisors also highly encouraged guards to get to know the artwork so that they could be knowledgeable about them when they interacted with patrons and visitors, he said. A curator at the museum also said that engaged, friendly gallery attendants were also very important; interaction was the key to countering museum fatigue for the attendant and the visitor. He also said that the museum also kept trying to improve art labels and text, by modifying their design and trying to place them in a better way. The average museum visit per visitor was no more than two hours, so legibility of art, text, and signage were important, according to him.

Does museum size post-expansion become a major cause of museum fatigue? This may be the case in the Met, but probably not at the Phoenix Art Museum. Many visitors may have complained that the Phoenix Art Museum has become very big after its additions, but in reality at 285,000 square feet it stood as fairly medium-sized, as per one volunteer. According to him, personal interest and education played a deciding role.

As a docent, it is important for us to engage our audience. People can leave any time they want. Very often, they gravitate only towards their interests in particular types of art, and in the process, miss lots of wonderful works.

One employee in visitor services said:

The expansions have helped in increasing membership numbers because of the perception of more space, more art, and therefore more value...At the same time many visitors say that they need to come back, it's too big. We say "Become a member and come back as much as you like."

Returning may be an option for residents of the city's metro area—a strategy that may work for smaller regional museums such as Phoenix Art or Nelson-Atkins, but not for bigger establishments like the Art Institute or the Met which have a large out-of-town or international tourist visitor base, with limited time at their disposal.

Benches—fixed, portable, or sometimes both—were observed in most galleries in Phoenix Art, however, a staff person informed me that most benches were underused because they were very low (about 15 inches high) or as in the case of portable stools—visitors did not know if they were available to them due to the lack of any signage or any other means of communication. And sometimes, the benches, both fixed and portable, were simply not enough—as per visitor feedback that she had received.

The measures taken to alleviate museum fatigue appeared to be more successful in the Nelson-Atkins than in the other three case studies. This was the only museum which on its visitor brochure, warned visitors of the effects of museum fatigue, and advised them to breaks or have conversations, as shown in figures 6.52 and 6.53 below:



**Figs. 6.52 and 6.53:** Excerpts from the visitors' brochure in the Nelson-Atkins Museum. Image source: Nelson-Atkins Museum visitor brochure.

Bags could also be checked in and best of all, museum admission was completely free, so visitors did not feel pressured to see the entire collection in one day and could return at their convenience.

The Nelson-Atkins was also the only case study that had adequate portable seats for visitors in addition to permanent benches in most galleries. Spaces where portable seats were hung were demarcated by clear signage visible to patrons. In Phoenix Art Museum, portable benches were provided in some locations but they were left unused most of the time. This is because they were not put in visible locations and there was a lack of any visible signage for visitors. Figures 6.54 and 6.55 below show a comparison of both scenarios:



**Figs. 6.54 (left):** Portable seats at the Nelson-Atkins Museum and **Fig. 6.55 (right):** Portable seats at the Phoenix Art Museum. Image source: author.

Benches, In the Art Institute of Chicago, on the other hand, were few and far between. Griffin court, the biggest space and the central atrium of the Modern Wing had only four benches, two pairs located opposite each other at the south end which led to the other wings and older buildings. The employee on the front information desk first appeared confused when asked about the availability of portable benches—clearly this was not a question he was used to answering. When pressed further, he said that portable chairs are not available to regular visitors, only to docents leading groups of students or school children. As for permanent benches in galleries, some of them in the new wings and the older building appeared to have them and many did not—their presence appeared to be arbitrary and was perhaps, governed by curatorial preference. For example, some galleries on the first floor of the Rice Building had benches while some did not have any at all. Same for the galleries on the second floor of the Rice, as well as the second floor galleries above

the Gunsaulus Hall. Many galleries had once bench off to the side of the gallery, hardly adequate for the masses that were constantly traversing these areas or stopping to look at exhibits.

In the Met, similarly, *no portable seats* were available at all, and permanent benches were available only in certain galleries. It was clear that visitor seating was not a priority at the Met and the Art Institute. Table 6.3 below summarizes the percentage of art galleries that had at least one permanent bench available for visitors in each of the four museums, based on the number of galleries that were observed in each museum (see Methodology section for how these galleries were selected).

**Number of galleries with benches in each of the four museums**

Museum	Number of galleries observed (sample size, n)	Number of galleries with at least one permanent bench	Percentage of galleries with at least one permanent bench
Metropolitan Museum of Art	47	19	40.43%
Art Institute of Chicago	42	16	38.1%
Nelson-Atkins Museum of Art	21	17	80.95%
Phoenix Art Museum	21	13	61.9%
Total	131	65	49.62%

**Table 6.3:** Percentage galleries with at least one permanent bench, based on the number of galleries observed (n) in each museum.

We can see that only the Nelson-Atkins did reasonably well (80.95%) while the Met and Art Institute had very low percentages of galleries with permanent benches (40.43% and

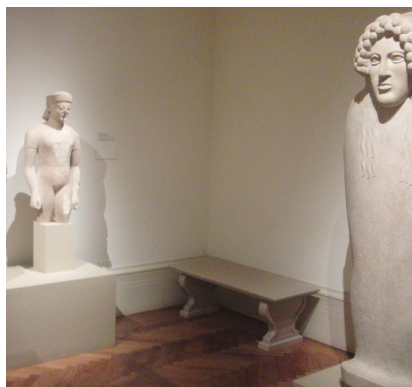


38.1% respectively). Note that both these museums did not have portable seats available either. The Phoenix Art Museum did slightly better (61.9%), and it had portable seats, but these were mostly not used by visitors due to reasons discussed earlier.

Simply providing benches in galleries may not be enough; bench/seat design may also be important. Amenities such as having benches and a good museum café were very important, according to one curator at Phoenix Art. The new museum benches, he pointed out, were great—they were sturdier than before, more comfortable, and had space for books on the sides. The Phoenix Art Museum was the only case study in which permanent bench design had received special attention, in large part, due to the efforts of the museum's exhibition designer who strongly felt that the lack of seating was the main cause for museum fatigue in visitors. After receiving many complaints about not having enough benches as well as problems with the existing ones from visitors, he took on the task of designing new benches on his own. He conducted research on which bench dimensions would be ideal for people to sit and view art, as well as factors such as ideal heights for the seats (about 19.5 inches) and armrests for them to bolster themselves up to get back on their feet after sitting down—a concern voiced by senior patrons in the museum over the years. He also provided surfaces on both sides of the bench to put books and exhibition catalogs or for visitors to put their purses or bags. These benches are shown in figure 6.56 below, and have been provided only in the American, Western American, and European art galleries so far but may be implemented in more galleries in the future according to him.

The design of benches in the new wings as well as older parts of the other three museums can at best be described as minimal as seen in figures 6.57, 6.58, and 6.59 below. No special

consideration was given to the bench dimensions or the provision of extra side surfaces for books, purses, bags, or children. There were no armrests at all. Sometimes, they were also found to be positioned in awkward corners (see figure 6.59) or sides of galleries that were seldom used by visitors or chosen as resting places.



**Figs. 6.56 (top left):** Permanent bench in the Phoenix Arts Museum, **Fig. 6.57 (top right):** in the Bloch Building, Nelson-Atkins Art Museum, **Fig. 6.58 (bottom right):** in the Greek and Roman, Met, New York, and **Fig. 6.59 (bottom left):** in the Modern Wing, Art Institute of Chicago. Images source: author.

The lack of adequate seating and visible amenities such as restrooms and water fountains—factors found to contribute to museum fatigue in a big way—was quite obvious in the Met and Art Institute. Water fountains and restrooms at the Met and Art Institute were hard to find because of the museums' size and complex layout. They were harder to find in the Met because they were not located off common areas such as lobbies, but at

locations in selected galleries. One was also struck by the fact that there were no restrooms in the entire Greek and Roman Wing, as well as the entire Rockefeller Wing adjacent to it on the West, which form the entire southeast corner of the museum. A restroom was visible only after entering the Wallace Wing from the Rockefeller. No gents restrooms were provided on the first floor of the American Wing either; there was only one ladies and one accessible toilet available there. To get to a men's restroom, one had to go to the mezzanine level and walk all the way to the end of gallery 774, the largest gallery in the American Wing.

The numerous new additions, by and large, did not appear to alleviate museum fatigue at all. Museum fatigue seemed to increase in proportion with building size and was clearly a growing concern with employees and visitors.

## Museum cafés



**Fig. 6.60:** Sign listing various cafes at the Metropolitan Museum of Art. Image source: author.

Large museums such as the Met and the Art Institute provided visitors with a variety of options for dining or snacks as indicated by the sign in the Met shown in figure 6.60 above. Museum cafés—as many employees pointed out—served as amenities that played a big role in alleviating fatigue, visitor attendance, and generating revenue for the institution. When it came to cafes, location was observed to play a big role in their popularity.

The Art Institute had a café on the lower level, adjacent to the McKinlock courtyard (completed and opened to the public in 1924 (Hogan, 2009)), one on the second floor, and one at the top level of the Modern Wing (known as the Terzo Piano—after the museum architect) that spilled out onto the roof terrace in favorable weather. Getting to the roof, however, is complicated. At the northwest corner of the Modern Wing, the escalator ran up only one way to the Terzo Piano restaurant. After getting to the lobby, one was confused about how to get to the roof, before realizing that the elevator was the only way up. Visitors also frequently took the wrong elevator and then realized there was no connection on the third floor, according to one museum security guard. There was no other visible, easy way to go up, other than the Nichols bridge outside that connected the restaurant to Millennium Park across the street. Wayfinding and connectivity of the Terzo Piano restaurant in the Art Institute were problematic issues.

The dining experience at the Terzo Piano restaurant was quite disappointing. The service was slow, the menu was very limited and the food was overpriced. The price for an entrée ranged from \$15 to \$23 (for example, \$16 - \$17 for a salad, \$15 - \$17 for a small flatbread pizza, \$17 - \$18 for a pasta, \$17 - \$23 for other main entrées), comparable to some good Chicago restaurants, but the service was slow, menu selections were few, and portion sizes

were small. The space was bright and airy but the seating afforded no privacy and tables were too closely spaced. The Caffè Moderno, on the second floor of the Modern Wing as shown in figure 6.61 below, appeared to be in the middle of nowhere. Most of the space was taken up by a high table in the center with bar stools, on which visitors sat closely packed together, busy with their phones with an uncomfortable silence. Some visitors were heard complaining that the power outlets to charge their phones in wall booths were not working. The worst part, however, was that this café was smack in the middle of visitor circulation routes to the architecture and design galleries on the west side of the building, as a result of which people—visitors and security guards included—were always trying to get out of each others way throughout the day.



**Fig. 6.61:** The Modern Wing Café, Art Institute of Chicago. Image source: author.

The cafes in the other three museums were all located in interior spaces, but most of them were adjacent to outside spaces with big windows. The café in the older building of the

Nelson-Atkins for instance, was in a lively, sky-lit courtyard known as “Rozelle Court” (shown in figure 6.62 below) and was also more affordable than all the other cafes observed in the four museums. Lunch was a buffet with a plenty of different options; the price of a meal over here, which included a soft drink, an entrée with a salad or a side dish, and desert, ranged from \$10 to \$15.



**Figs. 6.62:** Rozelle Court, Nelson-Atkins Museum. Image source: author.

The Rozelle Court was also pointed out as the best space in the Nelson-Atkins museum by many employees in the survey. The Bloch building’s Creative Café, was unfortunately a wasted, unused space due to reasons discussed in the survey results. In the Met, the café off Petrie Court and in the American Wing provide panoramic views of Central Park, though the largest café in the older building was located in the basement with no windows, views, or daylight. The Phoenix Art Museum café was located next to the outdoor sculpture garden and though it was not easily visible upon entering the building, it was easily visible and accessible from outside, through the sculpture garden.



All cafés in the four museums other than the Rozelle Court café in the Nelson-Atkins were found to be expensive, however, most of them were still well visited; patrons appeared to be willing to pay more perhaps out of pure convenience or because they considered it to be a part of the museum visit. Overall, The Met, Art Institute, and the Phoenix Arts Museum appeared to invest carefully in their cafés in new building additions, usually providing them with prime locations inside the building and were not afraid to charge visitors premium fare for this experience. The Bloch building café was unfortunately, not planned carefully at all; what the museum decides to do with this unused space in the future remains to be seen.

### **Summary of key issues discussed in front stage spaces**

Based on observations made in front stage spaces at the Metropolitan Museum of Art, Art Institute of Chicago, Nelson-Atkins Museum of Art, and the Phoenix Art Museum, and on-site interviews with five employees at the Nelson-Atkins Museum of Art and five employees at the Phoenix Art Museum, table 6.4 below summarizes how each of the four museums performed in different categories related to accessibility, wayfinding, connectivity, and fatigue:

<b>Category impacting accessibility, wayfinding, connectivity, and fatigue</b>	<b>Metropolitan Museum of Art</b>	<b>Art Institute of Chicago</b>	<b>Nelson-Atkins Museum of Art</b>	<b>Phoenix Art Museum</b>
Clear, visible entry and exit	✓	✓	✓	✗
Easy accessibility via elevators and/or ramps	✗	✗	✗	✗
Easy-to-find restrooms with clear, visible signage	✗	✗	✓	✓
Easy-to-find water fountains with clear, visible signage	✗	✗	✓	✓
Adequate seating in lobbies, atria, and courtyards	✗	✗	✓	✓
Adequate seating in galleries	✗	✗	✓	✗
Connections between galleries, different curatorial sections of the museum	✗	✗	✓	✗
Easy-to-find, visible café in the new wing (at least one)	✗	✗	✗	✓
Easy-to-find, visible museum store in the new wing (at least one)	✓	✓	✓	✓

✗ = Less than satisfactory, ✓ = Satisfactory or more than satisfactory

**Table 6.4:** Performance of four case studies in different categories related to accessibility, wayfinding, connectivity, and fatigue. Source: author.

## Perceptions and experiences of some other architectural features

### Outdoor spaces:

Outdoor spaces in the Nelson-Atkins museum campus were always open to the public 24/7 and were very popular with the local community. To the south of the museum was the extensive 22 acre Kansas City Sculpture park with “Shuttlecock “ installations on the grass lawn by artists Claes Oldenburg and Coosjevan Bruggen shown in figure 6.63 below.



Though criticized by the media and community at first, these shuttlecocks are now the most popular visitor attractions outside the museum; people were playing games, running, or walking their dogs on the lawn around these sculptures at various times of the day. On the west side of the lawn were sculptures by artists such as Henry Moore with walkways and benches in-between and on the east side were the “lenses” of the Bloch building (addition by architect Steven Holl) that rose up the grassy slope towards north. On the north of the museum campus was a reflecting pool: “One Sun / 34 Moons”, by artist Walter De Maria shown in figure 6.64 below, around which was the driveway to arrive the main entrance in the Bloch Building or the secondary entrance directly into the older museum building. This pool had lights that were turned on at night; its reflections came up to the water surface and attracted visitors who gathered around it during after-hours events.



**Fig. 6.63 (left):** “Shuttlecock” sculptures by Claes Oldenburg and Coosje van Bruggen on the Kansas City Sculpture Court (south side) of the Nelson-Atkins Museum of Art. Image source: author. **Fig. 6.64 (right):** Reflecting pool: “One Sun / 34 Moons”, by Walter De Maria on the plaza (north side) of the Nelson-Atkins Museum of Art. Image source: author.

The Phoenix Arts Museum on the other hand, only had a small outdoor sculpture garden in between its North and South Wings and adjacent to the cafeteria, which did not appear to be popular because of high temperatures in Phoenix at the time of observation (around

100F during the day). When the weather was more comfortable, from November through March, it is a well-used space as per employees comments. This garden had attractive installations and sculptures, tables and chairs to sit outside the cafeteria, walkways and trees that provided much-needed protection from the sun.

Open spaces in the Metropolitan Museum of Art campus, on the other hand, were formed only by the interior spaces and courtyards of the building—there were no “outdoor” spaces, even though the museum is located inside Central Park, Manhattan. Around the periphery of the museum in Central Park, on its north, south, and west sides, there were no entry or exit points – except for emergency exits inside. Blank, fortress-like walls and glazed museum facades as shown in figures 6.65 and 6.66 below conveyed only one message: *keep out!* Through glazed walls of the new additions, one could see only veiled reflections and partial inside glimpses at all times of the day, and there was a sense of disconnect between the building and the park at all times. Even the benches on the pathway around the museum faced away from the museum towards the park; closed-off and blank museum walls offered no opportunities for any visual appreciation whatsoever—of the building or the people inside it.



**Figs. 6.65 (left) and 6.66 (right):** Views of the Met from Central Park. Images source: author.

The interior courtyards, such as the Petrie Sculpture Court did provide the museum visitor with much needed resting spaces, offering a temporary reprieve from the maze of interior galleries in various wings. It would have been even better, as discussed earlier, if amenities such as restrooms and water fountains were located directly off these courtyards—which acted as gathering spaces for visitors—however, this was not the case.

In the older part of the Art Institute building (completed 1924), the lower level McKinlock courtyard adjoining the cafeteria was under construction and closed at the time of observation, but it is a very popular outdoor space well-used by visitors and members of the museum as per published reviews and previous visits to the museum. The Pritzker Garden in the Modern Wing shown in figure 6.67 below, on the other hand, was observed to be seldom used—even on a day when the weather was ideal to be outdoors; sunny with a temperature of 75F in the mid-afternoon at the time of observation. The reasons for this are varied—there is no seating (once again), the surfaces are wood, hard gravel, and concrete instead of soft grass, and there is a lack of any information and signage; the doors

are closed and visitors are unaware there is an outdoor space that they can step out onto. Overall, the garden does not have much to offer the visitors at all.



**Figs. 6.67:** Pritzker Garden in Modern Wing, Art Institute of Chicago. Image source: author.

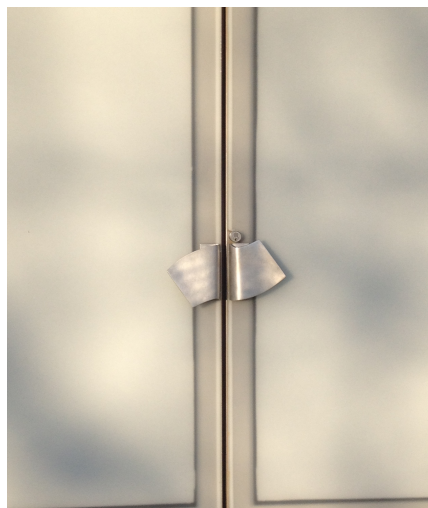
Haptic perceptions and experiences in the museum:

Our narrative of the museum is framed by our personal and collective perceptions and experiences, and aside from the things that we see with our eyes, our perceptions and experiences are generated by surfaces that we touch. In a museum, the surfaces that we touch are limited to the surfaces that we walk on—consisting mostly of different floor finishes, , and ones that we touch, push, or pull with our hands—consisting of doors and door handles usually on building entrances or exits and restrooms, and sometimes in entrances to special exhibition rooms which are closed off separately. Art objects, of course, are usually off limits, except for interactive or informational objects—which were found to be limited to informational touchscreens and tablets in some art galleries.

In the Bloch building of the Nelson-Atkins, architect Steven Holl had paid careful attention

to way in which door surfaces and handles to push or pull were designed. As shown in figure 6.68 and 6.69 below, each door handle was curved to fit into the palm of a hand when pushing or curving your fingers around the surfaces when pulling. While it was not apparent whether these surfaces made pushing or pulling these doors easier than usual, they definitely added more interest, variety, and also came across as features that were unique and custom-made for the addition.

The restroom surfaces were not neglected either—push and pull handles on their doors had similar designs as those on entry/exit doors, as shown in figures 6.70 and 6.71 below. The handrails on sides of stairs and ramps shown in figures 6.72, 6.73, and 6.74 below also appeared to continue this design approach; careful attention was paid to the way each railing terminated at the ends, with curves or a twist in the profile before it touched the side wall. The material appeared to be cold, anodized metal, but dimensionally, the handrails were perfectly sized to grip and move forward with one hand. The metal surface was also slightly rough so that one could get a good grip.



**Fig. 6.68 (left):** Push surfaces and **Fig. 6.69 (right):** Pull handles on entrance doors to the Bloch building, Nelson-Atkins Museum of Art. Images source: author





**Fig. 6.70 (left):** Push surfaces and **Fig. 6.71 (right):** Pull handles on restroom doors to the Bloch building, Nelson-Atkins Museum of Art. Images source: author



**Fig. 6.72 (left), Fig. 6.73 (middle), and Fig. 6.74 (right):** Stair handrail details in the Bloch building, Nelson-Atkins Museum of Art. Images source: author

No special consideration was given to the user experience in the design of door handles and handrails in the other three museums and their additions. The designs appeared to be minimalistic and contemporary in the Modern Wing (see figure 6.75 below) and the new additions of the Phoenix Arts Museum (see figure 6.76 below) but they also looked like standard fittings that were picked from a manufacturer's catalog; ones that may be found in

any other building. Hand rails to grip, push, or pull in both these additions, were in fact, very similar to one another.



**Fig. 6.75 (left):** Door handles in the Modern Wing, Art Institute and **Fig. 6.76 (right):** Door handles in Phoenix Art Museum. Images source: author

In the Met, none of the additions had separate entrances from the outside or doors inside. The restrooms had ordinary push or pull surfaces and handles. The entrance doors on 5th avenue did not appear to have a special design; the doors stayed perpetually open in any case, because of the amount of visitor traffic constantly entering and leaving the building at all times. The stair handrails were different between wings and also within each wing. Some of them such as the ones in Lehmann Wing between first and ground floors were also too big to grip with the hand and provide adequate stability as shown in figure 6.77 below.



**Fig. 6.77 (left):** Hand rail in the Robert Lehmann Wing, Metropolitan Museum of Art. Image source: author.

Floor surfaces in the Bloch building (shown in figures 6.78 and 6.79 below) were mostly gray terrazzo in lobbies, the gallery walk, and dark stone, gray terrazzo, or wood in galleries and event and meetings rooms. The transitions between different materials did not seem abrupt like in the older building but the surfaces felt hard after walking for some amount of time—especially since the gallery walk was long. The gray terrazzo was also damaged in some areas—more than the usual wear and tear one would expect in seven years of use.



**Figs. 6.78 (left):** Transition between terrazzo and wood in the galleries and **6.79 (right):** Gray terrazzo with some damage in the Bloch building, Nelson-Atkins Museum of Art. Image source: author



In the Phoenix Art Museum, different floor finishes appeared to be provided in different curatorial sections, but light wood was dominant (shown in figure 6.80 below) and there was some uniformity only in corridors and lobbies which had dark (very often green) stone finishes (shown in figure 6.81 below) or dark terrazzo finishes. Overall, there appeared to be too many types of floor finishes and transitions for a small museum—even though they were all neutral colors.



**Fig. 6.80 (left):** Floor finishes in the American art galleries and **Fig. 6.81 (right):** Floor finish in the Greenbaum lobby, Phoenix Arts Museum. Image source: author.

The Modern Wing at the Art Institute, Alsdorf galleries in Gunsaulus Hall (galleries 140-143), and Greek, Roman, Byzantine galleries (150-154) designed/renovated by architect Renzo Piano (2009) had light wood floors but many parts of the older wings had stone floor finishes (as shown in figures 6.82 and 6.83 on the next page).



**Fig. 6.82 (left):** Floor finish in the Modern Wing and **Fig. 6.83 (right):** Floor finishes the Rice building, Art Institute of Chicago. Image source: author.

Stone finishes in the older parts of the Art Institute building (constructed from 1893 to 2009) were mostly polished neutral-colored stone (white, light grey, light brown) and were cold in appearance compared to wood. Daylight falling on the wood floors of the Modern Wing, however, made it appear warm, while daylight reflecting off the neutral stone in the other parts of the museum (such as the Rice building shown in figure 6.82 above) did not appear to have the same effect. Some other art galleries such as the Impressionism art galleries (galleries 201, 225-226, and 240-243) also had wood parquet flooring, but the wood was darker, and it did not make the ambience as bright and lively as the light wood flooring in the Modern Wing. The light wood flooring also felt lighter and bouncier under one's feet as compared to the dark wood. Some floor finishes at the Art Institute also changed abruptly—for example the wood floor finish in the Greek, Byzantine, Roman galleries 150-154 changed to light stone in the adjacent Rubloff building gallery 144 to the east, housing the exhibit “Chagall’s America Windows” as shown in figure 6.84 below. These changes made different wings in the Art Institute appear as separate structures

instead of creating smooth transitions and unifying the museum building interior for visitors.



**Fig. 6.84 (left):** Floor finishes (from wood to stone), first floor, Art Institute of Chicago. Image source: author.

The floor finishes in the Met, much like the older Art Institute or Nelson-Atkins building, appeared to be random and changing with every gallery, resulting in abrupt transitions between different rooms. For example, white marble in the medieval castle turned in to dark brown granite at the threshold as shown in figure 6.85 below, and led to terrazzo at the main stair from the Great Hall. In some instances there were two types of wood separated by strip of dark stone in-between galleries; similar transitions were observed throughout the museum—surprising, especially since they were all designed by the same architect, Kevin Roche. It was as if with each new wing, Roche had experimented with different floor finish materials, colors, stairs, and handrails. Most of the floor surfaces being hard stone, contributed to walking fatigue. Galleries that were carpeted felt softer and provided a temporary relief, but carpeted galleries were very few—they were observed

only in selected galleries such as a part of the Lehmann wing as shown in figure 6.86 below.



**Fig. 6.85 (left):** Floor transitions at the medieval castle and **Fig. 6.86 (right):** Floor finish in the Lehman wing, Metropolitan Museum of Art. Images source: author.

Carpets may not always be practical for museums which receive heavy foot traffic, and floors of which need to be cleaned everyday. On occasion, heavy art objects also need to be moved as the collection is rotated or special exhibitions change. There was a marked difference, however, between walking on wood and stone finishes. Wood felt warmer and softer because when one stepped on it as compared to stone which always felt hard, cold, and stiff. Too many different types of floor finishes besides resulting in abrupt transitions between rooms, made spaces look busier than they already were (with numerous objects on display), and at times, resulted in too much light and color contrast to the eye; all of which appeared to contribute to fatigue. For example, sculptures in the Leon Levy and Shelby White sculpture court in the Greek and Roman galleries at the Met as shown in figure 6.87 below, were hard to appreciate individually against the busy black,



white, and gray marble stone pattern on the floor. Very often, their finer details were lost against the busy floor surface; the color pattern was a distraction more than anything else. At times, there was also too much reflection of daylight coming in from the skylights above, resulting in excessive glare and visual discomfort.



**Fig. 6.87:** Floor pattern in the medieval castle in the Leon Levy and Shelby White sculpture court in the Greek and Roman gallery wing, Metropolitan Museum of Art. Image source: author.

Daylight:

Daylight formed a big part of the museum narrative, but it was exceptionally dominant in the Bloch building at the Nelson-Atkins Museum. The Bloch building addition is made up of a row of four connected building forms, each one completely made up of glazed wall system because of which they are known as “lenses”, a term that is commonly used by the media, museum staff, and visitors whenever referring to these glass box-like buildings.

After setting forth on the paved walkway along the west of the Bloch Building and climbing up the hilly slope to the lenses, it was tempting to touch the glazed building façade which felt cold but was surprisingly, not smooth. The glazing had a striated surface that made it rough to touch. Various architectural details on the exterior were carefully planned; they highlighted the positions and meeting of different materials. The door handles at various entry/exit doors also stood out—metal curved surfaces designed to fit into the contours of the plan, with curves designed to push or pull as discussed earlier.



**Fig. 6.88:** Western facade of two Bloch building lenses during sunset at the Nelson-Atkins Museum of Art. Image source: author.

In the evening, the rays of the setting sun fell on the glass walls as shown in figure 6.88 above, creating an orange glow, patterned by shadows of tree branches. At some instances, there were ripples, due to light reflecting off various landscape elements such as gravel, pebbles, stone and metal. The eastern façade was flanked by a busy thoroughfare. Even though the light was diffused, the rows of lenses created an impressive edge which

appeared high because of the built-up site. Internal floor slabs appeared to be accentuated on the outside by metal bands cutting through the glass.

When sunlight hit the eastern façade edge in the morning directly (shown in figure 6.89 below), the façade, because of its translucent double glass wall, did not appear to reflect it at all. Instead, it seemed to absorb the energy, glowing and shimmering in the direct rays of sunlight. Tree branches cast shadows that fell in ripples across the vertical striations of the glass and added to its dynamic appearance.



**Fig. 6.89:** Eastern edge of the Bloch building during sunset at the Nelson-Atkins Museum of Art. Image source: author.

The lenses of the Bloch Building looked like or bright lanterns at night as shown in figure 6.90 below—that drew one towards them. The reflecting pool on the north seen in figure 6.91 below, also looked attractive, with circles of light looked like they were floating on the water. On one evening, crowds of visitors were observed around this pool, gathered for an after-hours museum event. The museum promoted these events almost every week, as I

was told by an employee, in order to draw younger crowds from the surrounding Kansas City community as well as to showcase the Bloch building at night, when it was arguably, at its best.



**Figs. 6.90 (left):** Lenses and **Fig. 6.91 (right):** reflecting pool at the Bloch building, Nelson-Atkins Museum. Images source: author.

In the daytime, one was aware of daylight when inside the Bloch building all the time, as it kept changing throughout the day. Daylight made its presence felt in all the art galleries, ramps and walkways, and visitor lobbies (see figure 6.92 below). The Noguchi sculpture court was at a prime location at the southern tip of the building; it had clear glazing through which it connected to the museum campus and the sculpture garden beyond on the west campus of the museum, as shown in figure 6.93 below. An employee in presentation and exhibition design at the Nelson-Atkins said:

We play with daylight as a variable in the Bloch building and do not compromise the collection. [This] provides visitors with a longer and refreshing experience.



One docent said:

Museum fatigue comes in the Met or the Louvre but not in this building [Bloch].  
There is more fatigue in the older building because of the lack of [day]light. [One]  
can't see outside.



**Fig. 6.92 (left):** View from the plaza-level visitor lobby and **Fig. 6.93 (right):** Noguchi sculpture court in the Bloch building at the Nelson-Atkins Museum of Art. Image source: author.

The museum store shown in figure 6.94 on the next page, unfortunately, was completely devoid of the natural light which came through the rest of the building. It was located in the lower lobby level, adjacent to the entrance lobby next to the underground parking garage. This was a space that could have potentially benefitted much from being more open and visible from outside—at the time of observation it was a little cramped and did not come across as being active and lively. It should, perhaps, have been positioned where the current Creative Café (an used space as discussed earlier) is located. At this location, it would have been visible from the plaza outside as well as the inside, being located immediately after the Bloch building from the main plaza-level entrance.



**Fig. 6.94:** Museum store in the Bloch building at the Nelson-Atkins Museum of Art. Image source: author.

There was daylight in the art galleries of the Bloch building, however, it appeared to have been introduced very cautiously and only at selected locations. Curators had weighed in heavily on how and how much daylight was introduced in galleries as per employees, after architect Steven Holl presented several iterations of scale models of these spaces. There are some niche-like display areas off the gallery-walk which receive daylight through the lens wall and skylight above. In the main art galleries, such as the African art gallery shown in figure 6.95 below, the lighting strategy consisted of introducing daylight through a high skylight in the curved ceiling, so that it entered indirectly into the art gallery space after bouncing off adjacent ceiling/wall surfaces. Some exhibits such as the photography exhibition shown in figure 6.96 below or parts of the African art collection were deemed too sensitive to even receive this indirect form of daylight.



**Fig. 6.95 (left):** African art gallery and **Fig. 6.96 (right):** Photography gallery in the Bloch building at the Nelson-Atkins Museum of Art. Image source: author.

In the Phoenix Art Museum, at some places there were some intriguing details and openings to bring in natural light, but there were some areas in the museum with too many finishes and exposed materials, making spaces look fragmented or disconnected. “I don’t know what this is or why it was done this way”, said one docent, pointing at the dark concrete/terrazzo staircase in the North Wing with an expression of puzzlement mixed with annoyance. “I hate this sudden brutalistic architecture style, it makes it looks discontinuous [with the rest of the building]”.

Some design maneuvers in Phoenix Art also were not successful at creating the phenomenological experiences that they were perhaps, intended for. For instance, the staircase in the South Wing eastern side that vertically connected all the levels was built inside a light well with glass panels and water at the lower level as shown in figure 6.97 below. Upon descending the stairs and entering into the lower level galleries of contemporary art, there were chairs against a glass wall with water on the outside, at the same level. No visitors were observed to gather here and stand or sit on the chairs to take a break, or look at the water through the glass, or up at the sky. The ramp that connected to

the mezzanine-level Modern art galleries in the South wing had randomly-shaped, arbitrary openings along the side walls, appearing to have no purpose or effect whatsoever. Further, the museum has had to install railings or glass surfaces to block these openings for safety reasons (as per an employee), which made these openings look even more unsightly in appearance, as shown in figures 6.98 and 6.99 below.



**Fig. 6.97 (left):** Seating next to the light well in the lower-level contemporary art gallery and **Figs. 6.98 and 6.99 (above and bottom right):** Openings in the side wall of a ramp at the Phoenix Art Museum. Images source: author.

The dimensions of some art galleries and their lighting, on the other hand, were better planned. One curator was appreciative of these features in the new Katz Wing for Modern and Contemporary Art built as part of the 2006 addition and the Steele Gallery for special exhibitions built as part of the 1996 addition.

The additions have opened up spaces that can highlight areas of the collection better than before. The 900 square foot Steele gallery constructed in 1996 was a huge asset—it housed the special Egypt exhibition immediate after it was completed, an exhibition that was very popular.



The Katz Wing was undergoing renovation work and was therefore closed off at the time of observation, however, the Steele Gallery was observed to be a large voluminous space with a special exhibition underway. The dimensions of this gallery along with its careful electrical lighting were positive features, however, the lack of any daylight in this space as shown in figure 6.100 below, was clearly perceptible.



**Fig. 6.100:** Steele gallery the Phoenix Art Museum. Image source: author.

In the Metropolitan Museum of Art, most of architect Kevin Roche's wings had sloped glazed walls on one side, creating a greenhouse-like aesthetic. This transparency was perhaps provided to make these wings bright and airy, but to describe them all in this way would be incorrect—daylight worked in different ways in each wing of the museum.

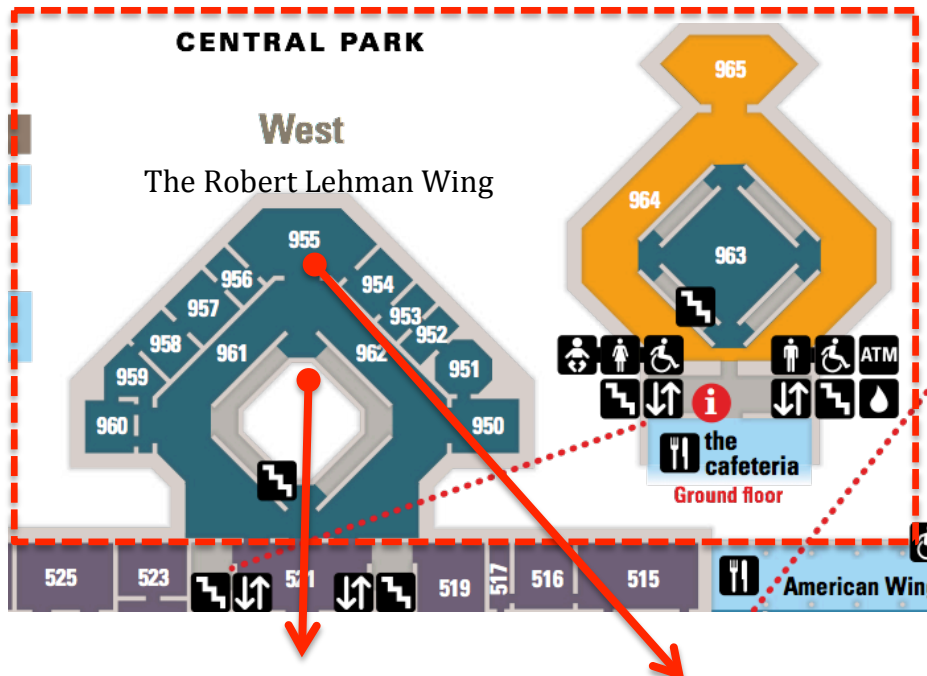
The Rockefeller Wing in the Met had a floor-to-ceiling glazed wall that faced Central Park and also brought in a considerable amount of daylight, due to which this wall was observed to be covered with shades at all times, even on an overcast day. The completely glazed wall,

was ideal for a view of Central Park but the delicate and valuable collection (consisting of the arts of Africa and Oceania) was not.

The clear glazed windows in the Egyptian wing with the Temple of Dendur, in contrast, were left completely open, creating a lot of visual glare with direct sunlight, making objects against the wall and one half of the room difficult to view. No one was observed to be using the benches either, which were in direct sunlight.

The Wallace Wing, with its modern and contemporary collection of artists such Picasso, Kandinsky, and Matisse amongst many others, looked surprisingly drab and dull, especially inside its windowless first floor galleries with a neutral gray carpet, white walls and ceiling, and electrical lights. The transition into these galleries from the Rockefeller wing made one even more acutely aware of the complete lack of daylight and views inside this space. The Levine Court on the mezzanine was, on the other hand, a completely different space. Filled with daylight streaming in through gray shades that covered a completely glazed ceiling/roof done in what seems to be a signature of the architect Kevin Roche, this room felt refreshing, bright, and airy. Its light wood floor also seemed to make a positive contribution to this ambience.

The Lehman Wing received daylight from a big skylight in the center, but most of its galleries on both levels—first floor and ground floor, were located at the back of the hallway around the atrium as shown in figure 6.101 below, and were extremely dark, claustrophobic spaces devoid of natural light and crammed with artwork. Spaces like this made one uneasy and tired; they attracted many visitors because of the collection, but they were not observed to stay for very long.



**Fig. 6.101:** Infographic showing partial first floor plan and ground floor plan of the Robert Lehman Wing (above), Gallery 955 on first floor (lower right) and the central skylight above courtyard (lower left). Images source: Met visitor map and author. Infographic by author.

What appeared to work best with the natural light in the Met, were not the art galleries, but the interior courtyards in some wings—the sculpture court in the Greek and Roman Wing, the Petrie Sculpture Court, and the Charles Engelhard court in the American Wing shown in

figure 6.102 below—flooded with natural light, with views to Central Park and to the sky from skylights, and some seating with chairs and benches, they provided much-needed resting areas for weary museumgoers.



**Fig. 6.102:** Charles Engelhard Court, American Wing, Metropolitan Museum of Art. Image source: author.

Courtyards and atria in the Art Institute were used in a similar manner. Natural light streamed in through large voluminous spaces such as the Grand staircase in the older building, open-air McKinlock court adjacent to the lower level museum café and member's lounge, the sculpture court in the Rice building, and the Griffin court formed by the atrium in the Modern Wing, shown in figure 6.103 below. These spaces were observed to be used by visitors to gather, rest, and relax; though there was a severe shortage of seating as discussed earlier. The Pritzker garden adjacent to the Modern Wing also brought natural light into the Griffin court and along the staircase that led up to the galleries, but as a gathering space on its own, it was mostly unused by visitors due to reasons discussed earlier—lack of signage, seating or surfaces to relax and play.





**Fig. 6.103:** Griffin Court, the Modern Wing, Art Institute of Chicago. Image source: author.

Architect Renzo Piano employed an intricate roof system with louvers and glazing popularly known as his “flying carpet” (Blandford, 2012, p. 58) to bring daylight into the Modern Wing. Diffused daylight entered the third floor art galleries through a ceiling scrim below louvered/glazed roof system as shown in figure 6.104 below. Galleries on the north side of the Modern wing had side windows opening out to carefully framed views of Millennium Park across the street as shown in figure 6.105 below. Daylighting and views in these galleries made them feel more dynamic and interesting; one felt like spending some more time in these spaces looking at art, views outside, or relaxing. The special exhibition galleries on the west side of the Modern Wing on the first floor, and ironically, the architecture and design gallery on the second floor shown in figure 6.106 below, did not avail of daylighting and views to the outside at all.



**Fig. 6.104 (left):** Modern Art gallery on the third floor of the Modern Wing and **Fig. 6.105 (right):** View of the Chicago skyline and Millennium Park from an art gallery on the second floor of the Modern Wing, Art Institute of Chicago. Image source: author.



**Fig. 6.106:** Architecture and Design gallery in the Modern Wing, Art Institute of Chicago. Image source: author.

Regenstein hall (shown in figure 6.107 below), which is also on the second floor of the Rice building by architect Thomas Beeby, has the distinction of being the largest gallery in the

entire museum and houses special exhibitions, but it received no natural light, save for a small amount that came in through the glazed panels of doors that are closed off at its southern end. Some galleries on the second floor of the Rice building received daylight, however, it appeared static in these spaces as compared to ones in the Modern Wing, perhaps because it was too uniformly diffused by the roof system before entering through the ceiling skylight as shown in figure 6.108 below.



Fig. 6.107 (left): Regenstein Hall and Fig. 6.108 (right): An art gallery and on the second floor of the Rice building. Image source: author.

One must note, however, that this wing was constructed in 1988, 21 years prior to the Modern Wing (2009) and the understanding of daylight and daylighting technology may not have been as advanced at that time. Constant changes in color or light level in these spaces, were just not as perceptible, as they were in the Modern Wing. Piano's roof in the Modern Wing, is made of four layers in the third floor galleries: a glass roof is supported on delicate steel trusses. Rows of white metal blades (similar to louvers) opening up towards

the north and filtering out direct southern light, are supported on top of these trusses. Thin fabric panels stretched below the trusses soften the light and the view from the galleries (Ouroussoff, 2009) as shown in figure 6.109 below. This system allows for the daylight to be filtered to address art conservation concerns, but maintains its dynamic quality so that changes in its intensity and color due to sky conditions, weather conditions, are still perceptible to the human eye.



**Fig. 6.109:** The ceiling of an art gallery and on the third floor of the Modern Wing, Art Institute of Chicago. Image source: author.

...it is the light that most people will notice [in the Modern Wing, Art Institute]. Mr. Piano has been slowly refining his lighting systems since the mid-1980s...Over the years these efforts have taken on a quasi-religious aura, with curators and museum directors analyzing the light in his galleries like priests dissecting holy texts. (Ouroussoff, 2009, p. C1).

The roof design of the Modern Wing such in the Art Institute of Chicago demonstrates how daylighting technology and design has improved over the years, and this in turn, has improved lighting quality in newer wings of art museums.

Key issues from observing daylight in the selected museum additions are summarized below as follows:

- Steven Holl's Bloch building in the Nelson-Atkins and Renzo Piano's Modern Wing in the Art Institute were two museum additions that stood out amongst the rest for daylighting in art galleries. Daylight had a natural, changing, and dynamic quality in these spaces. It was, however, very carefully introduced by carefully detailed roof or wall systems in order to address art conservation concerns. Certain galleries such as parts of the photography gallery and African art galleries in the Bloch were only electrically lit due to the sensitivity of artwork on display.
- In all the other museum additions, daylight was effectively used only in visitor gathering and circulation spaces as lobbies, courtyards, atria, and stairways. Visitors gravitated towards these gathering spaces which looked, active, and appeared to alleviate museum fatigue to some degree.
- In some cases, direct sunlight was also found to create negative conditions such as glare and visual discomfort. The quality of daylight coming in through control systems such as those in the Bloch building and the Griffin court in the Modern Wing appeared to be more effective in countering glare than spaces such as the Petrie Sculpture Court in the Met. They created a more comfortable environment for public gathering.

From observations of daylight, we will move to actual measurements of daylight that were taken in museum back spaces and front spaces, and try to understand what they mean, in the next section.

## **Part 4: Lighting measurements**

The Illuminating Engineering Society of North America's publication for museum lighting standards "Museum and art gallery lighting: A recommended practice" (1996) was used as a reference guide to compare with actual lighting measurements that were taken in the four museums—in their front spaces: common public circulation and gathering areas, and art galleries. Table 6.5 below shows IESNA's recommended standards for lighting levels in art galleries based on the type of art material on display and table 6.6 shows lighting levels that are required for accessibility in museums which apply not only to art galleries, but also common circulation and gathering areas such as hallways, lobbies, courtyards, and atria. One should note that lighting levels displaying art in galleries are only recommended and museums are not held to these standards; very often they set their own standards through previous experience—what has worked and what has not in the past—and the preferences of curators and exhibition designers, as conversations with employees at the Nelson-Atkins and Phoenix Art Museums revealed.

Museums, however, just as other institutional buildings are supposed to maintain accessible lighting levels for certain design elements, which are required as per the American with Disabilities Act standards (ADA, 2010). Lighting levels as per 2010 ADA standards are in fact, same as the IESNA recommended levels shown in table 6.6 below, but IESNA goes into more detail, giving additional information for categories such as ambient lighting, specimens and objects, etc. that are useful for museum environments; this table is therefore used as reference for this discussion.



**TABLE 3.1**  
**Recommended Total Exposure Limits in Terms of Illuminance Hours Per Year to Limit Light Damage to Susceptible Museum and Art Gallery Artifacts**

**Note: All ultraviolet radiation (400 nm and below) should be eliminated.**

<b>Types of Materials</b>	<b>Maximum Illuminance (Neither value should be exceeded)</b>	<b>Lux-Hours/Yr</b>
Highly susceptible displayed materials: textiles, cotton, natural fibers, furs, silk, writing inks, paper documents, lace, fugitive dyes, watercolors, wool, some minerals.	50 lux	50,000
	<i>Note: Approximately (50 lux) × (8 hours per day) × (125 days per year). Different levels (higher or lower) and/or different periods of display (4 hours for 250 days) may be appropriate, depending upon material. If in doubt, consult a conservator.</i>	
Moderately susceptible displayed materials: textiles with stable dyes, oil paintings, wood finishes, leather, some plastics.	200 lux	480,000
	<i>Note: Approximately (200 lux) × (8 hours per day) × (300 days per year). Lower levels may be appropriate, depending upon material. If in doubt, consult a conservator.</i>	
Least susceptible displayed materials: metal, stone, glass, ceramic, most minerals.	Dependent upon exhibition situation.	

**Table 6.5:** Minimum standards for lighting levels in art galleries by material of the art displayed. Image Source: IESNA (1996, p.14).

**TABLE 2.2**  
**Accessible Lighting Levels<sup>13</sup>**

<b>Application</b>	<b>Lux</b>	<b>Footcandles</b>
Ambient lighting	50–300	5–30
Text Panels	100–300	10–30
Controls	100	10
Directional signage	200–300	20–30
Specimens, objects	100–300	10–30
Ramps, stairs	100–300	10–30
Visitor pathways	100–300	10–30

(See **Section 3** for effects of exposure to light on artifacts)

**Table 6.6:** Minimum standards for accessible lighting levels for different design elements in museums. Image Source: IESNA (1996, p. 11).

One must note that the exposure limits shown in table 6.5 do not eliminate permanent damage to susceptible art by display lighting completely (Cuttle, 2000, IESNA, 1996). To limit this damage, therefore, IESNA (1996) recommends an annual exposure limit of 50 lux for 8 hours per day, for 125 days a year for highly susceptible art, and 200 lux for 8 hours per day for 300 days a year for moderately susceptible art, as shown in table 6.5.

In the back spaces of the museum where lighting measurements were taken in employees work spaces and compared to the industry lighting standards for general office spaces set by IESNA's publication, "The Lighting Handbook." According to these standards, the illumination on a work surface area should be in an average range between 300 and 750 lux depending on the visual complexity of the task at hand (DiLaura, D. Houser, K., Mistrick, R. and Steffy, G., 2014).

### **Measurements in back stage spaces**

37 different types of work spaces in the Nelson-Atkins Museums and 12 different types of work spaces in the Phoenix Art Museum were measured for illuminance levels resulting in a total of 49 different work spaces in both museums combined. This sample included a range of different types of work spaces and functions such as administration offices, librarian's offices, library stacks, library research and acquisition rooms, registration offices, visitor services, human resources, imaging and photography studios, x-ray labs, conservations offices and work areas, COO's or CEO'S offices, executive staff offices, conference and meeting rooms, curators' offices, security manager's office, mail rooms, coat check, front desk, information desk and reception areas, shipments and art receiving areas, art prep areas, metal fabrication spaces, museum retail storage, and employee break



rooms. The work spaces in the Nelson-Atkins Museum were distributed between the lower level of the older building and the basement (commonly known as “B-level”) of the new addition—the Bloch building. Most work spaces in the Phoenix Art Museum were in an adjacent, Administration building and some were located behind the receiving dock area of the North Wing of the museum building.

Table 6.7 below shows how many work spaces in both museums fell within the range of industry lighting standards set by IESNA (300 to 750 lux for general office spaces depending on the complexity of the task) and how many were below or above this range. These work spaces are sorted as per their location—next to a window or a core area of a work space such as cubicles in an open office plan, or a windowless room, since daylight was found to significantly increase illuminance levels.

**Illumination levels in back stage spaces as per workspace location and IESNA recommended levels**

Workstation location	Illuminance measurements (means in lux)		
	E<300 lower than IESNA recommended range	300≤E≤750 within IESNA recommended range	E>750 higher than IESNA recommended range
Next to window	0	8	12
Core area	11	18	0
Total	11	26	12

Sample size, n = 49 at Nelson-Atkins Museums of Art and Phoenix Art Museum combined

**Table 6.7:** Range of illumination measurements in employee back stage spaces sorted by workstation locations.

We see that 26 (53.06%) workspaces in both museums had an average illuminance

between 300 to 750 lux—within the industry standard, while 11 (22.45%) were below 300 lux and 12 (24.49%) were above 750 lux. All these 12 workspaces were next to windows, therefore, daylight was the main reason for higher illuminance levels. We also see that none of the spaces next to a window fell below the recommended illuminance levels. While higher lighting levels from daylight are more tolerated by humans than higher levels from artificial light as per IESNA, a few work spaces such as those in the executive office suite on the second floor of the Bloch building in the Nelson-Atkins Museum with light levels ranging from 1327 (executive meeting room) to 2027 lux (COO's office) were observed to have glare conditions due to daylight—a combination of direct and diffused—entering the space from the exterior glazed wall system, causing some amount of visual discomfort. The glazing system, had built-in daylight control mechanisms, but they were partially unsuccessful in reducing glare.

We can conclude, that from the standpoint of task illuminance and general office lighting, the majority of work spaces were within the standards set by IESNA; in a few cases the light levels were too low for general office work or too high, causing uncomfortable glare conditions.

The proportion of museum employees that were neutral or dissatisfied with their work space lighting, discussed in survey results earlier, is high considering the fact that most of their work spaces meet industry lighting standards with a few exceptions, probably because most of them were in windowless spaces without daylight or views to the outside as they indicated in their responses. 53% of workstations were found to be in core areas, away from windows or were completely windowless offices.

To further clarify the potential cause of dissatisfaction, however, a correlation analysis was performed between the levels of employee satisfaction with their overall work spaces ( $n = 55$ ) collected from the survey, and average illuminance measurements ( $n = 49$ ). The correlation was found to be weak ( $r = -0.071, p = 0.63 > 0.05$ ). A second correlation analysis was performed between the levels of employee satisfaction with the amount of light ( $n = 55$ ) in their work spaces and mean illuminance measurements ( $n = 49$ ). The correlation, was once again, found to be weak ( $r = 0.024, p = 0.87 > 0.05$ ). Both correlation tests are statistically insignificant; they reveal the lack of any association between employee satisfaction with their overall work spaces or the with the amount of light in their work spaces, and average illuminance measurements. Larger samples (55 respondents, 49 lighting measurements were used in this study) may have yielded significant results, but most likely, they would not have changed the result—Pearson's coefficient,  $r$ —by more than plus or minus 0.18 which would still be considered as weak (Hole, 2013).

These results add credence to the finding from the survey that meeting illuminance requirements alone does not provide good design solutions or guarantee employee satisfaction. Workplace satisfaction appears to be influenced by factors such as daylight, views to the outside, privacy, and noise as per employee survey responses.

The measurement exercise in back spaces also reinforces the importance of conducting post-occupancy evaluations. Designers need to move beyond industry standards for lighting levels and pay more attention to other environmental attributes such as windows with daylight and views which are known to affect employee satisfaction, health, and productivity as per previous studies (Heerwagen, 1998). New additions with daylighting

and other major upgrades in visitor spaces at the Nelson-Atkins Museum and the Phoenix Art Museum did not improve working conditions for employees in back spaces. Both museums would have benefitted greatly from conducting internal post-occupancy surveys of their employees (working in the older building) before plans for their new additions were well underway.

### **Measurements in front stage spaces**

Lighting measurements were also taken in museum front stage spaces in all four museums which consisted of art galleries, common resting, gathering, and circulation areas such as lobbies, courtyards, hallways, stairs, ramps, museum stores, and museum cafes.

Selection criteria for galleries that were measured is described in Methodology. A total of 180 galleries were measured in the four case studies, out of which 9 galleries (50%) were in the older museum building and 90 galleries (50%) were in new (post-1970) additions.

Two lighting measurements L1 and L2, were taken in art galleries used to sort art galleries as shown in tables 6.8 and 6.9 below. L1 measurements were taken in the galleries near a work of art on display—from as close as a visitor was allowed to get. As shown in table 6.8, the art galleries were sorted as per those that were less than or equal to and those that exceeded the IESNA recommended maximum light level for type of art materials. For galleries with least susceptible materials on display (stone, ceramic, metals, etc.) IESNA is flexible for lighting levels and recommends levels that depend on the situation of the exhibition as we can see in table 6.5 above, which for the decision-makers may interpret as “use your best judgment.” For purposes of comparison, however, the same level recommended for moderately susceptible art materials—200 lux—has been used as the

most conservative estimate. Table 6.8 on the next page, presents illumination levels in art galleries categorized by the type of art material on display, near the art (L1), showing how many comply with IESNA recommendations for art conservation and how many do not. These findings are significant for lighting from an art conservation perspective in all four museums. They tell us whether light levels in art galleries were optimal for conserving art with minimal degradation due to light exposure for one year as per table 6.5 shown earlier.

**Number of art galleries in compliance and not in compliance with IESNA recommended light levels for art conservation**

Galleries by type of art material on display	Illuminance measurements recorded, L1 (in lux)			
	L1≤50 <b>within IESNA recommended range (in compliance)</b>		L1>50 <b>higher than IESNA recommended range (not in compliance)</b>	
Galleries with highly susceptible art materials on display	In older museum building	In post-1970 additions/ wings	In older museum building	In post-1970 additions/ wings
	11	4	8	4
	L1≤200 <b>within IESNA recommended range (in compliance)</b>		L1>200 <b>within IESNA recommended range (in compliance)</b>	
Galleries with moderately susceptible art materials on display	In older museum building	In post-1970 additions/ wings	In older museum building	In post-1970 additions/ wings
	43	39	10	14
	L1≤200 <b>within most conservative assumed range (in compliance)</b>		L1>200 <b>higher than most conservative assumed range (may or may not be in compliance)</b>	
Galleries with least susceptible art materials on display	In older museum building	In post-1970 additions/ wings	In older museum building	In post-1970 additions/ wings
	13	13	5	16

Sample size, n = 180 art galleries; 90 in older building, 90 in new additions

**Table 6.8:** Range of illumination measurements in art galleries sorted by type of art material on display.

L2 measurements were taken in the galleries at the center of a gallery—in a walking aisles between exhibits or near a bench, if it was present . As shown in table 6.9 below, the art galleries were sorted as per those that fell within the IESNA recommended range for accessible light levels for ambient lighting (30 – 500 lux), and those that had above or

below the recommended levels. These findings presented in this table, are significant from an accessibility perspective in all four museums. They show us how many art galleries were safe for people with disabilities to navigate on the basis of their light levels, as well as whether the light levels were adequate for people with disabilities to clearly identify and look at art objects (IESNA, 1996).

**Number of art galleries in compliance and not in compliance with IESNA recommended light levels for accessibility**

	Illuminance measurements recorded, L1 (in lux)					
	L2<50 lower than IESNA recommended range (not in compliance)		50≤L2≤300 within IESNA recommended range (in compliance)		L2>300 higher than IESNA recommended range (not in compliance)	
Galleries sorted by lighting levels for accessibility	In older museum building	In post- 1970 additions / wings	In older museum building	In post- 1970 additions / wings	In older museum building	In post- 1970 additions / wings
	57	35	29	42	4	13

Sample size, n = 180 art galleries; 90 in older buildings, 90 in new additions in the Met, AIC, Nelson-Atkins, and Phoenix Art Museums combined.

**Table 6.9:** Range of illumination measurements in art galleries sorted by accessible lighting levels.

Comparison with recommended lighting standards for art materials:

A total of 123 galleries (68.33% of all galleries measured) had light levels that fell within the IESNA recommended range for highly susceptible (less than 50 lux) and moderately susceptible (less than 200 lux) art materials combined. In this group, 15 (12.19%) of art galleries were with highly susceptible art and 82 (66.67%) galleries were with moderately susceptible art as shown in table 6.8. 26 galleries with least susceptible art (21.14%) were

also included in the overall count of 123 galleries which were compliant with recommended standards since they had light levels less than 200 lux, the conservative estimate that was assumed (the same maximum standard used for moderately susceptible art galleries). From the group of 123 galleries that were compliant, 67 galleries (54.47%) were located in the older building, and 56 (45.16%) were located in newer wings or additions.

36 galleries (20% of all galleries measured) consisting of 12 galleries (33.33% of the group) with highly susceptible art and 24 galleries (66.67% of the group) with moderately susceptible art had light levels that were higher than the maximum recommended standards (50 lux and 200 lux respectively). Some examples of such galleries included the Italian Renaissance Drawings gallery in the Robert Lehmann Wing at the Met (90.5 lux), the American Modern Art 1900-1950 gallery in the Rice Building at the Art Institute (283 lux), and the Norton gallery of Photography in the South Wing of the Phoenix Art Museum (94.3 lux). The Nelson-Atkins Museum of Art had the distinction of being the only one of four museums that had all art galleries with highly or moderately susceptible art work that met recommended lighting standards. Out of the 36 galleries that were non-compliant with lighting standards in the other three museums, 18 (50%) were in the newer additions or wings and 18 (50%) were in the older buildings of the museums.

21 galleries (11.67% of all galleries measured) with least susceptible art also exceeded the maximum, however, they were not included in this same group count since IESNA is flexible for their lighting levels stating that it should be according to exhibition situation (as per table 6.5 above). Further, the high illuminance levels were due to daylight; the lighting



guide states that higher levels of daylight are more tolerated by the human eye than higher levels of artificial light, therefore, they do not raise much concern (IESNA, 1996, Cuttle, 2000). Some examples of these types of galleries were the Temple of Dendur at the Met, the Hellenistic art gallery in the Rubloff building at the Art Institute (565.7 lux), a Contemporary art gallery in the Bloch building at Nelson-Atkins (241.4 lux), and the Marshall Contemporary art gallery in the lower level of the South Wing at the Phoenix Art Museum (376.15 lux).

Compliance with lighting accessibility requirements:

A comparison of actual lighting measurements against required levels for accessibility in table 6.9 showed that only 39.44% of sample light levels in galleries (71 out of 180) complied with the standards for ambient lighting requirements (50-300 lux). 51.11% of light levels ( 92 out of 180) were too low; they were less than 50 lux that is required for ambient lighting. Some examples of such galleries were Egyptian Art gallery in the Sackler Wing at the Met, the Special exhibition gallery on the first floor in the Modern Wing at the Art Institute (28.3 lux), the Special Photography exhibition gallery at Nelson-Atkins (6 lux), and the Phoenix Art Kids gallery in the upper level of the North Wing at Phoenix Art Museum (45.3 lux). Since these 71 galleries had levels that were lower than ambient lighting standards for accessibility (50-100 lux), they also did not meet accessibility standards for reading text panels (100-300 lux), operating controls (100 lux), reading directional signage (200-300 lux), and looking at specimens and objects (100-300 lux) shown in table 6.6 above.

9.44% of gallery light levels (17 out of 180) were too high to meet accessibility standards; they were more than 50 lux. Some examples of such galleries were a Greek and Roman art gallery at the Met, the European Modern art gallery on the third floor of the Modern Wing at the Art Institute (452.6 lux), the niche gallery off the gallery walk in the Bloch building at Nelson-Atkins (941.4 lux). The Phoenix Art Museum did not have any galleries (that were measured) that fit in this category.

Of the non-compliant galleries, a majority of art galleries in the older building; 56% (61) were in the old building, however, a large proportion of art galleries 44% (48) were also in newer wings or additions.

In summary, a majority of art galleries appeared to meet the recommended lighting levels set by IESNA (2014) for different art materials, however, the bigger concern in many galleries was that they did not meet accessibility standards set by ADA 2010 or IESNA 1996. Curators, conservators, and exhibitions designers appeared to have been overly cautious in setting lighting levels in art galleries, one prime example of this being the Metropolitan Museum of Art's special exhibition gallery which housed its much-advertised, feature exhibit "Charles James: Beyond Fashion", at the time of the field visit on June 10, 2014. The illuminance measurement averaged only 2.6 lux in the entire gallery; too low for a visually impaired person to look at art, read text or signage, or to find accessible entry/exit routes once inside the gallery, giving rise to safety concerns as well as denying equal opportunity for people with disabilities; the main reason why ADA rules and guidelines were first signed into effect in 1990 ([www.ada.gov](http://www.ada.gov)). Old fabric and materials in dresses from the 1940s and 1950s that were put on display may have provided curators

and lighting consultants reason to keep light levels extremely low in this gallery. Light also played a big role in the choreography of the display, in which only particular details of the dresses were highlighted by light sources while the rest gallery was dark. The large crowds of visitors continuously moving inside this gallery at all times combined with its very dark interiors, however, made this gallery unsafe even for an individual without disabilities.

Light levels in public, non-gallery museum spaces:

Besides art galleries, illumination levels were also measured in common public spaces of museums such as museum cafes, stores, lobbies, courtyards, atria, stairways, and ramps. The main concern in these areas was whether they met the recommended light levels for accessibility. Most of them met the recommended levels with the exception of some spaces such as courtyards or atria with daylight which usually exceeded the recommended maximum. This was not of concern in spaces such as the Griffin court in the Art Institute of Chicago where glare from daylight (1056 lux) was carefully controlled with an intricately detailed roof system (see figure 6.110 on the next page) but it was of concern in areas of the Met such as the Charles Engelhard Court in the American Wing (2299 lux) and the Milton Petrie European Sculpture court in which daylight (1430 lux) came through the roof skylight without much control, resulting in glare and visual discomfort on bright, sunny days as shown in figure 6.111 on the next page.



**Fig. 6.110 (left):** Griffin Court, The Modern Wing, Art Institute of Chicago and **Fig. 6.111 (right):** Milton European Petrie Sculpture Court in the Metropolitan Museum of Art, New York. Images source: author.

Similar conditions were observed in the Grand Staircase of the older Art Institute of Chicago building (5266 lux), where direct sunlight penetrated the space through clear glazed skylights. The areas around the staircase on the second floor are also used to display art objects (see figure 6.112 below). Conservation of objects on display may have been taken care of via the use of appropriate glazing and filters in the skylight (though no evidence of this was found in literature on the Art Institute), but glare and visual discomfort experienced by visitors in this space while looking at objects as well as moving around was the main concern.



**Fig. 6.112:** Grand Staircase, Art Institute of Chicago. Image source: author.

One must also note that these courtyards and circulation elements also did not comply with the IESNA Committee on Museum and Art gallery lighting's recommendation for transitional spaces in museums that states:

Architecture provides the conduit for the human visual system to balance its sensitivity. Transitional areas allow the eye to gradually adapt from outdoor sunlight to the low light levels found in an art gallery. For example, vestibules, entrance halls, and circulation corridors can provide areas for the eye to adjust from the 10,000 lux [1,000 fc] of a sunny day to the 100 lux [10 fc] of an art gallery. For effective adaptation, the transitional spaces must be designed so that the visitor will spend five to eight minutes in the area. The exact time required for eyes to adapt will vary depending on each visitor's age. (IESNA, 1996, p. 13).

### **Summary of key findings from lighting measurements in museums:**

1. Employee work spaces in the back were adequately lit as per industry standards; the amount of light was not related to employees overall dissatisfaction with their work space conditions. Employee Dissatisfaction was found related to other environmental attributes such as windows, outside views, and privacy, and lighting measurements played a key role in revealing this finding.
2. Lighting levels in art galleries mostly met recommended industry standards, however, some of them did not meet accessibility requirements. Curators or exhibition/lighting designers in these instances were perhaps overly conservative in their concerns for art degradation, which may have impacted overall gallery lighting levels. Art gallery lighting added to the numerous accessibility issues with gallery walks, ramps, wayfinding, and connectivity in all cases that were discussed earlier.
3. Some public circulation and gathering spaces in museums such as courtyards and staircases had issues of glare and visual discomfort arising from daylighting. Daylighting control mechanisms in these cases were found to be inadequate, completely absent, or ineffective. These spaces also did not meet industry recommended design standards for visual comfort and transitional spaces.

## Part 5: Visitation: Counts and observations

Visitor counts and observations in art galleries of all four museums revealed some factors that appeared to influence visitation. In each of the four museums, galleries were assigned space syntactic typologies of a, b, c, and d based on where they were located in the museum layout. As discussed earlier in Methodology, an a-space is a dead-end occupation space with no movement potential, a b-space has more than one connection but lies on the way to a dead end, a c-space is 2-connected and on at least one ring so that we have one alternate return route, and a d-space is 3+-connected and on at least two rings, making it a movement space and tending to be a local focus for movement (Bafna, 2003; Hillier & Tzortzi, 2011). Visitor counts were made in a total of 124 selected galleries (the selection criteria of which is described in detail in Methodology) across all four case studies in their post-1970 museum wings as well as the older buildings. Their distribution is shown in table 6.10 below:

**Number of galleries in which visitor counts were conducted in all four museums**

Museum case study	Number of galleries in the older building	Number of galleries in post-1970 museum additions/wings	Total
Nelson-Atkins Museum of Art	10	5	15
Phoenix Art Museum	13	8	21
Metropolitan Museum of Art	14	32	46
Art Institute of Chicago	16	26	42
<b>Total</b>	<b>53</b>	<b>71</b>	<b>124</b>

**Table 6.10:** Distribution of visitor counts in art galleries of case studies. Source: author.

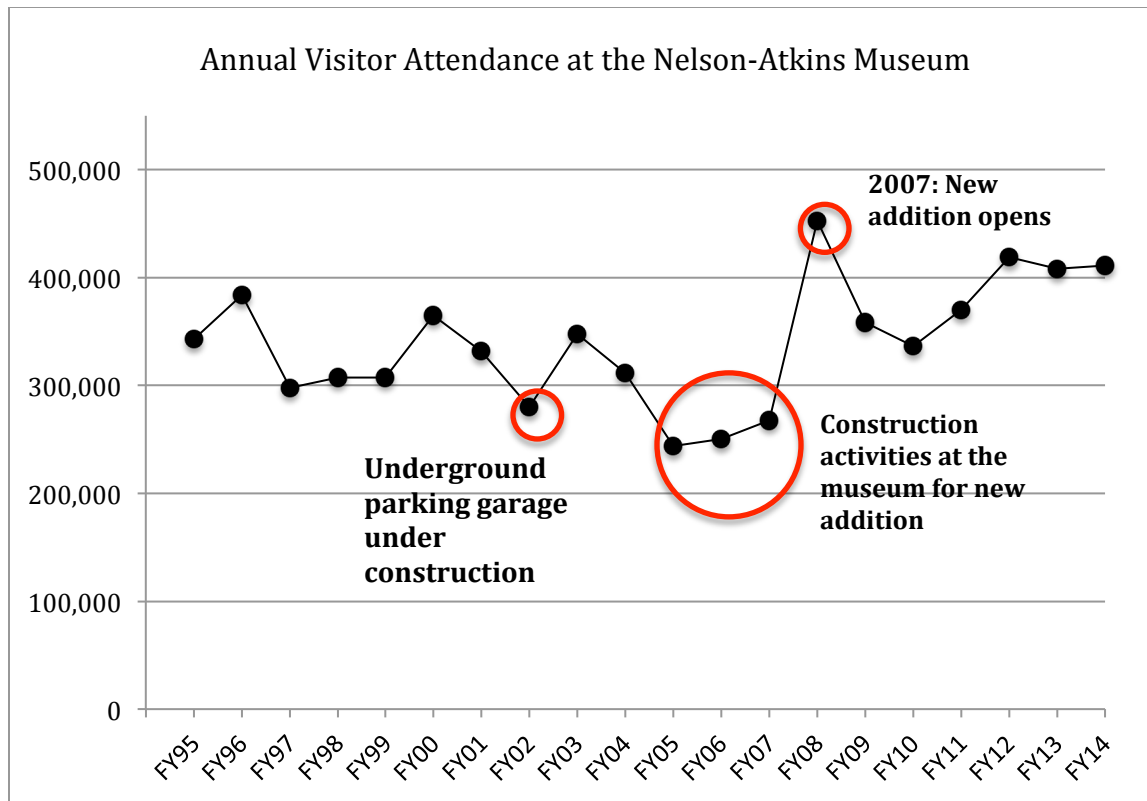
The time frame of 10 minutes for observing each art gallery may seem short at first glance, but previous studies and conversations with employees in visitor services and curators revealed that as per industry standard (in the art institution world), the average museum visit was about two hours and the average amount of time that a visitor gazed at an art object was only two or three seconds. Taking this into account, ten minutes per art gallery was deemed an appropriate time frame for visitor counts. Another reason for selecting this observation time frame was that it fit within the time and physical constraints of this research.

Numbers from visitor counts, along with space typologies are used to discuss various factors that may or may not have played a role in visitation. A brief overview of museum stores is provided and how their locations in the museum layout affected their visitation levels is discussed. The discussion is organized sequentially; it first touches on overall attendance numbers and admission policies, followed by an analysis of visitation levels in the art galleries and museum stores.

### **Annual attendance**

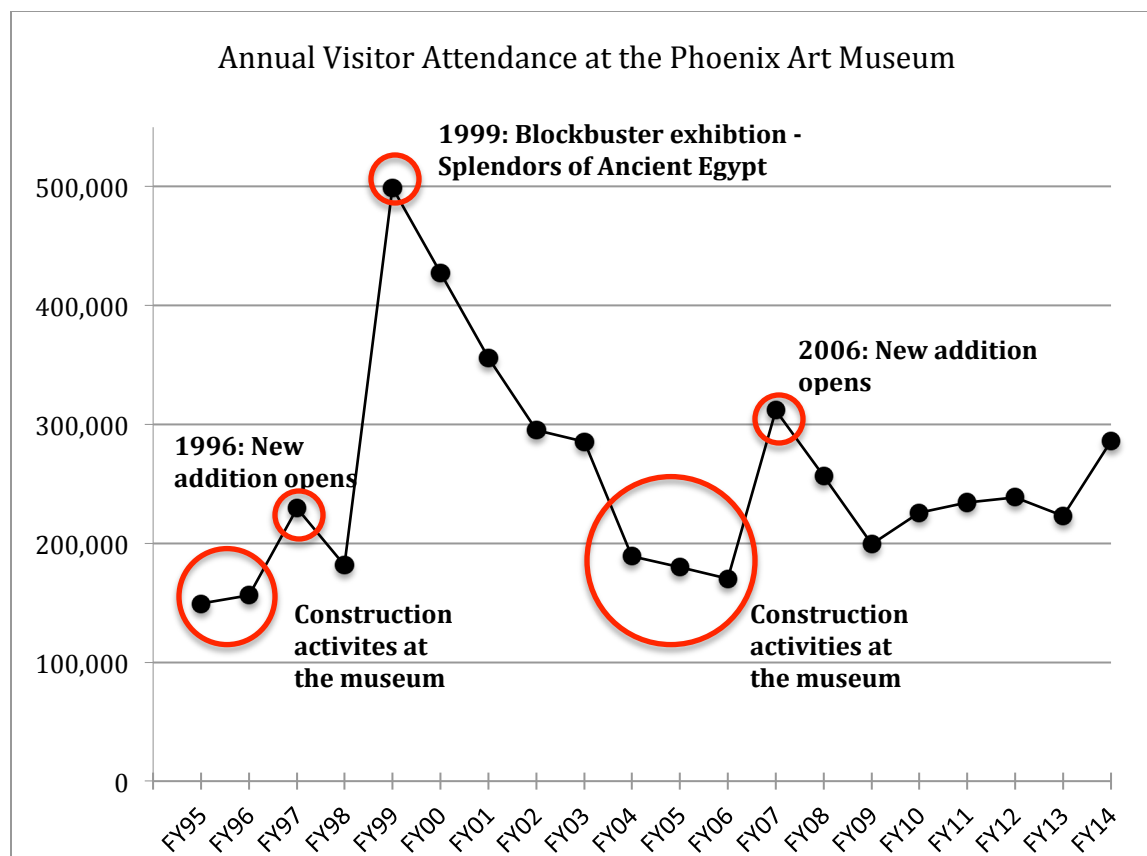
What can we learn from the annual visitor attendance in museums? Did attendance increase after the additions were built? The Nelson-Atkins Museum and Phoenix Art Museum shared their data for annual attendance numbers from 1995—the year prior to the first museum addition was built at the Phoenix Art Museum to their most recent count—annual attendance in the year 2013. This data was analyzed graphically as shown in figures 6.113 and 6.114 on the next pages, in order to answer these questions.





FYXX = Fiscal year. For example, FY14 = Fiscal year 2014, from 1<sup>st</sup> May 2013 through 30<sup>th</sup> April 2014.

**Fig. 6.113:** Annual attendance at the Nelson-Atkins Museum for the years 1995 to 2013. Graphic by author with numerical data provided by the Nelson-Atkins Museum.



FYXX = Fiscal year. For example, FY14 = Fiscal year 2014, from 1<sup>st</sup> May 2013 through 30<sup>th</sup> April 2014.

**Fig. 6.114:** Annual attendance at the Phoenix Art Museum for the years 1995 to 2013. Graphic by author with numerical data provided by the Nelson-Atkins Museum.

In both cases, we see that in the two or three years preceding the opening of an addition, there was a sheer drop in attendance due to temporary closures of galleries, parts of the building, and parts of the museum grounds due to construction. There was a visible spike in the annual attendance, however, immediately after the museum additions were completed and opened to the public in the years 1996 and 2006 for the Phoenix Art Museum and the year 2007 for the Nelson-Atkins Museum. These spikes indicate that following press releases, publicity, and advertising by the museums, people were curious to check out the new building with its new exhibitions and see what the hype was all about. In the years following the opening year of the additions, we see that the rise in attendance

started dropping off gradually. This effect may be stronger in smaller, regional museums such as the Nelson-Atkins and Phoenix Art Museums because they primarily serve the local community as compared to larger museums such as the Art Institute of Chicago and the Metropolitan Museum of Art which enjoy a wider national and international audience. Attendance figures in regional museums are influenced by repeat visits of members and local residents rather than first-time touristic visits , as the data suggests; a fact that was reiterated by employees that were interviewed.

Blockbuster exhibitions and shows at both museums were strong attractions. This result is most evident in the graph shown in figure 6.114 above, indicating that the Phoenix Art Museum received half a million visitors when the featured exhibition “Splendors of Ancient Egypt” was opened to the public. The museum has had other special exhibitions since then—such as the “Curves of Steel” in 2007, but they were unable match or break the record attendance in 1999. The Nelson-Atkins Museum has also had special exhibitions every year, however, its annual attendance saw spikes only in certain years before and after the 2007 addition, because some of the special exhibitions were more successful and popular than others. For example, in April through July 2002, the special exhibition titled “Eternal Egypt” received 114,434 visitors, as per the data provided by Nelson-Atkins Museum. Further, other activities such as the construction of an underground parking garage from April 2001 to August 2002 on the museum campus caused a dip in the overall attendance in these years as shown in the graph in figure 6.113 (see FY2002). During this time, visitors had to park off-site and be transported to the museum via a shuttle service, an inconvenience that did not resonate well with the regulars.

In the last three years, however, the Nelson-Atkins has maintained a steady stream of more than 400,000 visitors as indicated by graph shown in figure 6.113. The Director of Visitor Services and Administration at the Nelson-Atkins revealed that the staff tried to increase visitation by doing a better job at engaging the community, and planning more special events. They extended museum hours on Thursday and Friday nights (until 9 pm) and started having social events and lectures during this time. They also advertise “Bloch building lighting hours” from 30 minutes before dusk until midnight on Fridays and Saturdays and until 10 pm on other days when the lighting, which is a key feature of the new building, is on full display for the visitors. With regards to its attendance goals, the museum leadership is ambitious but realistic at the same time. The Director of Visitor Services and Administration said:

We no longer aspire to have one million visitors every year, as we initially did at the time of planning the Bloch building. We now have projections of 400,000 plus [visitors], hoping to touch half a million [visitors] soon.

The two museums’ physical growth and attendance numbers also appear to be closely linked to the cities’ physical growth, population, and infrastructure. In the course of 20 years from 1995 to 2014, the attendance at the Nelson-Atkins increased by 27,398 visitors and at the Phoenix Art Museum, it increased by 136, 498 visitors. As per the US Census Bureau (census.gov), from 1995 to 2013, the population of Kansas City, Missouri in which the Nelson-Atkins is located, grew from 434,444 to 467,007 residents ( an increase of 32,563) and the population of Phoenix, Arizona in which the Phoenix Art Museum is located, grew from 1,135,000 to 1,513,000 residents (an increase of 378,000). In 2006, a light rail was also established in the Phoenix valley area, with a light rail stop across the

street from the Art Museum (Steinhauer, J., 2009). The Nelson-Atkins Museum of Art is also well connected by public transport (a local bus route) and is within walking distance (about 15 minutes, 0.6 miles) from the Country Club Plaza—a popular tourist district with shopping, entertainment, and restaurants, but this infrastructure has been in place well before the 2007 addition was built. The Country Club Plaza was built in 1922 and the local bus routes have been in place since 1969, as per conversations with museum staff.

We can conclude that for both cases, museum attendance received a major boost after additions were constructed and opened to the public. People reacted to publicity, media coverage, or they were eager to explore a significant new development in their community. Public interest, however, appeared to wane and attendance numbers decreased in the years after. Attendance rose and then remained steady only after museums made a special effort to keep up visitation levels via special exhibitions and curated special events to engage the community. Museum additions appear revitalize an older museum building by increasing visitation for a short term, but it needs to be sustained over the long term via the museum's administration, management, and organization practices.

### **Admission fees**

Visiting an art museum can be pricey. An admission ticket at the Art Institute for instance, costs \$23 for an adult visitor with slight discounts for seniors and students (\$17 for both). Illinois residents have free admission from 5 to 8 pm on Thursdays, and they also have a minor discount (\$18 and \$20 respectively) from 10:30 am to 5 pm on Thursday and on other days of the week. After 4 pm on all days, the admission is \$10 for the one hour until it

closes at 5 pm. Seeing the museum's collection or even a part of it in one hour, however, is hard to imagine, given the museum's size.

The Metropolitan Museum is technically free to visitors, however, it asks for "Recommended fees" on large signs in the Great Hall (entrance lobby). These fees are \$25 for an adult ticket with discounts for seniors and students (\$17 and \$ 12 respectively); the most expensive of all four museums if the recommended fees were to be considered as actual fees. Further it says: "To help cover the costs of exhibitions, we ask that you please pay the full recommended amount." And even if one is not paying these recommended fees, as per museum policy, one needs to stand in line to get a ticket with a sticker that needs to be worn and visible to security guards at the entrances to galleries. Most visitors were observed paying the recommended fee, perhaps because they simply did not realize it could be free, or even if they knew, they may have felt awkward once they were in line and saw that others were paying money. The lines for tickets at both ends of the Great Hall also made the space more crowded or cramped than it already was. Long benches were put in a line in the center and visitors sat uncomfortably next to each other while a companion usually stood in line to buy tickets.

In 2012, the Met was the second most visited art museum in the world after the Louvre with annual attendance figures of 6.1 million visitors as per the annual Art Newspaper visitor attendance survey of 2012, but it no longer holds this distinction as per the latest survey of 2013 ( published in 2014). It came in third place after the British Museum which is, notably, completely free to visitors. The Met's attendance rose slightly from the previous year, with 6.2 million visitors, but it could not surpass the British Museum's 6.7 million

visitors in 2013 (Pes, J. and Sharpe, E., 2014). These attendance figures may have been affected by blockbuster shows, but there is strong indication that free admission may have been one of the influential factors (Pes, J. and Sharpe, E., 2014). One also wonders whether having a clear admission policy such as that of the Art Institute is better than having admission practices such as “recommended fees” that can be confusing for visitors.

Sometimes, visitors may also feel cheated after paying the admission fee. In the Art Institute of Chicago, several sections were closed for construction or maintenance – and many of these are the best spaces of the museum at the time of observation. This included McKinlock court, the museum’s prime outdoor space, which was being renovated and was sealed off without any notice or signs as to when it would reopen. The lower level architecture galleries were also closed. There was no architecture exhibition in the Modern Wing at all, only a small “Chicago-isms” exhibit off the Modern Café. The second floor architecture galleries in the Wing, instead, had a photography exhibition that was poorly visited. Curiously, the huge photography gallery on the first floor of the Modern Wing off Griffin Court only had one photograph hanging at the far end wall. There was no sign informing visitors whether the artist desired it to be this way or preparation work for an upcoming exhibition was in progress. Valuable real estate in an art museum which is the second most visited in the country (according to the Art News survey of 2013)—appeared to be wasted. Visitors were observed entering the gallery and looking confused before leaving.

In the Met several gallery closures were announced by a sign on a closed partition only upon getting there or as in one instance, simply by a large plastic sheet blocking off the gallery entrance.

Phoenix Art Museum, the smallest of all four, charged a comparatively modest fee of \$15 for admitting adults, \$12 for seniors and \$10 for students. There was no additional charge for the special exhibition on display in the Steele gallery at the time of observation, but the entire Katz Wing contemporary and modern art galleries and the Fashion design galleries constituting most of the South Wing of the museum were closed for remodeling in preparation for an exhibition. There was no information at the entrance indicating that these galleries were closed, even though there were brochures about upcoming exhibitions and this information was also found to be missing on the museum website at that time.

Museums need to constantly remodel their galleries to accommodate the needs of changing exhibitions, however, if visitors pay the full ticket price, then it is only fair that they be informed of this in the beginning of the visit via information brochures, signage, and desk attendants, and also most preferably on their websites and smartphone applications so that visitors can be well-informed even before they make the hike to the museum. Another option is to temporarily lower the admission fees. Museum maps also need to be updated to show which parts of the museum which are closed, which was not the case at the Met, the Art Institute, or Phoenix Art Museum.

The Nelson-Atkins Museum of Art was an exception. It had the most visitor-friendly admission policy of all four museums that were studied—it was completely free, for all five days of the week that it is open (Wednesday through Sunday), except for some special



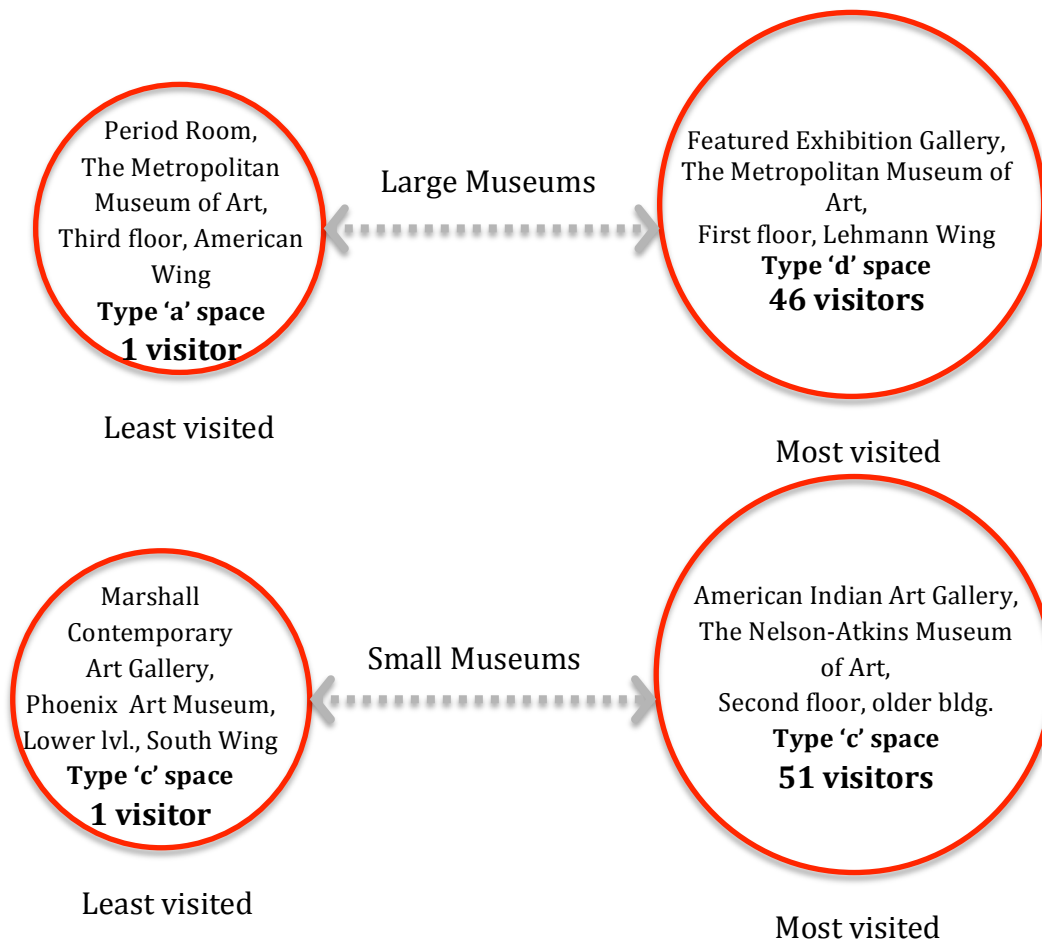
exhibitions, which were priced at \$12 for an adult ticket. Visitors were not required to get a ticket or a tag to wear at the entrance. Only the special exhibition section in the Bloch building was closed off because an installation was underway, but this was announced clearly via signs in different parts of the building. Volunteers always stood at the entrances, ready to direct and inform visitors about the museum as needed.

A comparison of four museums reveals that big differences in their admission policies and approach. Admission fees in addition to revenue from museum stores and cafes may be an important source of funding for museums and all of them cannot afford to be free, however, better communication and more effective methods of dispensing information may offer their audiences an added incentive to spend more in the museum, and perhaps even revisit in the future. The museum ticket, in the end, should be a good value for its price.

### **Art galleries**

Which art galleries were the most visited and which were the least? The Met and the Art Institute are large museums located in the popular tourist cities of New York and Chicago respectively, therefore they enjoy patronage from a wider international and domestic audience. The Nelson-Atkins and Phoenix Art Museum are smaller, regional museums that mostly serve the community in the metropolitan areas of Kansas City, Missouri and Phoenix, Arizona. The responses for this question, were therefore put into separate categories of large and small museums as shown in figure 6.115 on the next page.

**The least visited art galleries vs. the most visited art galleries in two large museums (Met and AIC)  
and two small museums (Nelson-Atkins and Phoenix Art Museum) as per visitor counts**



**Fig 6.115:** The least and most visited art galleries as per observed visitor counts in large and small museums. Infographic by author.

The most visited gallery from the Met and Art Institute galleries, as we can see in figure 6.115, was the special exhibition gallery on the first floor of the Robert Lehmann Wing in the Met which received 46 visitors in a span of ten minutes. This space was a type 'd' with three or more entries/exits, but one big draw to this gallery was that it had a featured exhibition called "The Pre-Raphaelite Legacy" on display, also advertised on the Met's "Now On View" brochure provided to visitors in the lobby.

The Art Institute of Chicago is also internationally known for its Impressionism collection with famous paintings such as the Georges Seurat's "A Sunday Afternoon on the Island of La Grande Jatte" and Monets' "Water Lilies" series. It was not far behind the Met in visitation, housing the second most well-visited gallery in both large museums: an Impressionism gallery on the second floor above Gunsaulus Hall. This room received 41 visitors in ten minutes and was also a type "d" space. Another very well-known and popular masterpiece, "Paris Street; Rainy Day" in the Impressionism collection located on the second floor in the Pritzker Galleries just after the Grand Staircase was very popular with visitors. The Impressionist paintings housed in the older section of the Art Institute building appeared to remain a big draw for the crowd, even after three newer wings were added to it after 1970.

The least visited art gallery in large museums was in the Met; a Period Room on the third floor of the American Wing in which only one visitor was observed in ten minutes. This was not only a type "a" dead end space, but it was also located in a part of the museum that was beset with wayfinding and connectivity problems as discussed earlier. The least visited art gallery in the Met was closely followed by the 1900-1950 American Art gallery on the second floor of the Rice Building in the Art Institute that received only two visitors. This was, once again, a type 'a' space in the Rice Building, which as per one gallery attendant, was not very popular with visitors because of the type of collection displayed: American Modern Art and Decorative Art.

In both large museums, besides the type of art on display, space syntactic typology appeared to have a strong influence on art galleries. The most connected type 'd' galleries

were also the most visited, and the least connected type ‘a’ galleries were also the least visited.

The most visited art gallery in the smaller museums was the American Indian Art Gallery on the second floor of the older building of the Nelson-Atkins Museum as shown in figure 6.115. This was a type “c” space, on a well connected and easily accessible route. It received 51 visitors in a ten minute time period, even more than the most visited gallery in the larger art museums (46 visitors in the Met special exhibit). The permanent collection of the Nelson-Atkins Museum is very popular with the Kansas City community and this was evident in visitor counts. The 2007 Bloch building addition was no match for it in this regard; its most visited rooms—two contemporary art galleries—received only 30 visitors each, in ten minutes.

The influence of wayfinding and connectivity on visitation was discussed earlier, however, the design and length of circulation elements and walkways also played a significant role in visitation and this was especially visible in the Nelson-Atkins Museum. The Noguchi Sculpture Court in the Bloch building, Nelson-Atkins Museum for example, was not well-visited even though it has an attractive exhibit; sculptures by the renowned, late Japanese-American artist Isamu Noguchi. It is last in the line of galleries in the Bloch building that run north-south along the gallery walk, but it is unique not because of its location, but because it is the only gallery with a clear glass façade and doors that connect it to the museum grounds on the west. The feature sculpture called “Fountain”, is a carefully carved piece of stone that has water emerging from it and running down into a pool up to the glass wall before continuing outside the building. With the illusion of the water running through

the clear façade, one sometimes got the impression that was completely open. At the time of observation, it stood as a type 'a' space, at a dead-end of the Bloch building because the connecting special exhibitions gallery to one side was temporarily closed for an installation in progress. There were doors through which one could walk outside, however, visitors did not know if they could use it (there were no signs) or did not attempt to use it for the fear of setting off an alarm.

The walk that ran north-south through the Bloch building—which includes the gallery walk previously discussed—also appeared to have a strong influence visitation levels in the building's art galleries. It is commonly referred to as the "quarter-mile walk" by museum employees (the walk is actually about 840 feet/0.16 miles in length). Observations revealed that as it progressed further away from the entrance lobbies on the south, visitor counts in the galleries on its east side gradually decreased. The contemporary art galleries L2, L3, and L4 situated in the beginning of the walk for instance, were the busiest ones, with visitor counts of 16, 30, and 30 respectively, in a ten minute span. All three were also well-connected, type 'd' spaces. After these art galleries, however, the African art gallery and Photography gallery situated further up the walk had counts of only nine and five visitors respectively, even though they were type 'd' and type 'c' spaces. These galleries were visited by a few school groups and docent-led tours, but they were not included in visitor counts.

Another notable reason for decreasing levels of visitation as the gallery walk progressed north was that there was a visible exit door after contemporary gallery L4. Many visitors were observed exiting the building through this door to access the sculpture park or walk

onto the sculpture terrace that led to the steps and main entrance of the older Nelson-Atkins building. They were perhaps, tired at this particular point of the gallery walk and saw an opportunity to leave or perhaps they thought that this exit door was the end of the Bloch building. Perhaps some of them also felt that they had seen enough contemporary art and wanted to see some of the older, famous works in the old building.

The reasons for different levels of visitation in the Bloch building are varied but it was clearly not as well visited as the older Nelson-Atkins building. The older building is not only bigger, but also houses most of its famous, permanent collection. The European galleries, especially, are very popular. Local visitors have fond memories of this museum while growing up, which has stood as a Kansas City icon ever since it opened in 1933 (Wood, T. & Slegman, A., 2007). The Nelson-Atkins Museum—as per an employee in visitor services—is not a tourist destination as much as it is a regional, community museum, receiving patronage from the surrounding population in the Kansas City metropolitan area. The community has warmed up to the newer Bloch building, but it may never become as popular as the older building. “There is not enough art in this building” or “I prefer the older building”, were some comments that visitors made in docent-led tours. Visitor counts in art galleries in the older Nelson-Atkins building reflected this too; visitors made an effort to find art galleries that housed popular, well-known works even if they were type “a” or “b” spaces. For example, the Chinese paintings room, a type “b” space which led to the Chinese temple, a type “a” dead end space, on the second floor of the older building still received 25 visitors in ten minutes, perhaps only because they housed permanent collections of the museum that were well known. The European art galleries were also observed to have a steady stream of visitors; one of them, a type “c” space received 45

visitors in ten minutes.

The Marshall gallery with contemporary artwork situated in the lower level of South wing of the Phoenix Art Museum was the least visited art gallery in the two smaller museums, with only one visitor in ten minutes. This count was very low compared to other art galleries in the museum, even after considering the fact that visitation in the Phoenix Art Museum is typically low in the hot summer months (the museum was studied in the month of August when the average day temperature was 100F or more), as per employees. It was a type “c” space, but getting to it was difficult—which appeared to be the main reason for this count. Since the Katz Wing on the first floor and the Fashion exhibition on the mezzanine level were under construction, visitors after entering through the main lobby in the North Wing and walking through the museum toward the south assumed that the museum had ended after they noticed that these areas were closed for access. As a result, they did not go past this point very often, in order to access the stairs or elevator to get down to the lower level galleries. The Modern Art gallery on the mezzanine level of the south wing was also not well attended (three visitors were counted) for similar reasons. The mezzanine levels of the north and south wings were not directly connected to each other and visitors did not make the extra effort to go up one level, get down, and then go up again, in their walk through the museum. This has been a problematic connection ever since the mezzanine levels were built, according to volunteers and employees at Phoenix Art Museum.

The two most visited art galleries in the Phoenix Art Museum were the Western Contemporary Art gallery in the upper level of the North Wing (10 visitors) and the Steele

special exhibition gallery on the first floor of the same wing (9 visitors). Both were type “a” spaces, but they were visible and easy to find. The Steele gallery was visible immediately after walking across the Greenbaum entrance lobby in the North Wing, and the stairs to get to the Western Contemporary Art gallery on the upper level were very visible too. The Steele gallery at the time of observation, had the special exhibition titled: “Antonio Berni: Juanita and Ramona”, and the Western Contemporary art had works by popular artists Chuck Close and Yayoi Kusama, among others. Adjacent to this gallery was also another gallery with a special photography exhibition on display, and visitors that came to up to look at any one of these two galleries tended to walk through the other before exiting the floor.

Syntactic typology, as visitors counts and observations revealed, was not as influential in the two smaller museums as it was in the two large museums. The most visited and the least visited galleries in both small museums were in fact, type “c” spaces that were well connected and accessible; other factors that were discussed—the museum’s history, art collection, wayfinding , and connectivity—all appeared to have a larger influence on their visitation levels.

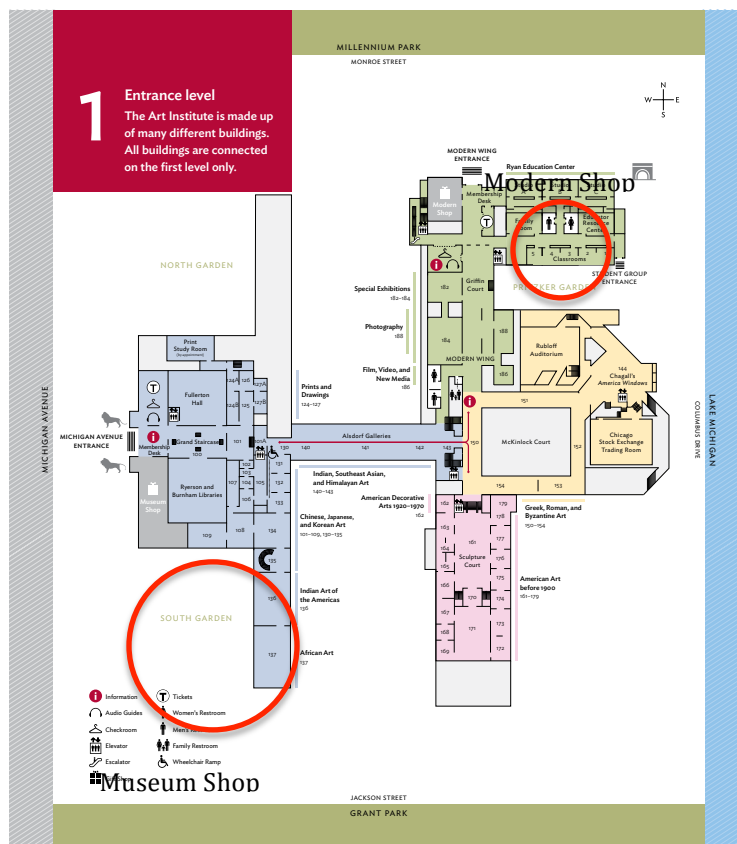
### **Museum stores**

Location, visibility, and signage appeared to play a big part in attracting visitors to museum stores and gift shops in the four art museums.

In the Art Institute, a comparison of visitor counts in the newer Modern Shop in the Modern Wing and older Museum Shop gave interesting results. Visitors entering both these both spaces, were counted for ten minutes each, on a Saturday afternoon. The museum



shop in the Modern Wing was considerably smaller in size than the one in the older building with a smaller selection of items. The older shop was also located right off the main entrance lobby on Michigan Avenue, next to the information desk, while the Modern Shop was located on the smaller Monroe Street on the North Side as shown in figure 6.116 below.



**Fig. 6.116:** Location of the two museum stores in the Art Institute of Chicago. Image source: Art Institute visitor map with infographics by author.

The visitor counts for both shops, however, were similar—41 visitors entered the Modern shop and 39 entered the Museum Shop on Michigan in a 10-minute time period. Visibility and accessibility had a strong influence on these numbers. The Modern Shop along with its selection of items can be seen through its glazed façade from outside and it is located

directly opposite Millennium Park—one of the most popular tourist attractions in Chicago. Many visitors were observed crossing street in order to get a better look at it. The Museum shop, on the other hand, is visible only after entering the building and it, unfortunately, goes unnoticed by the public on Michigan Avenue since it does not have a visible store-front at all. In terms of syntactic typology, the Modern Shop is also better connected—a type ‘c’ space with two separate connections to the museum lobby, as compared to the Museum Shop which is a dead-end, type ‘a’ space. While the type ‘a’ designation may have been of lesser concern for a small museum store, it is problematic in this case because the Museum Shop is a larger, longer, and deeper space with only one way in and out for regular, non-emergency use.

The Met has three museum stores; two on the first floor directly off the Great Hall on Fifth avenue and one on the second floor to the right of the lobby that comes immediately after going up the stairs as shown in figures 6.117 and 6.118 below. These three stores were not part of the Roche additions, but visitor counts and observations of these stores revealed some interesting findings.

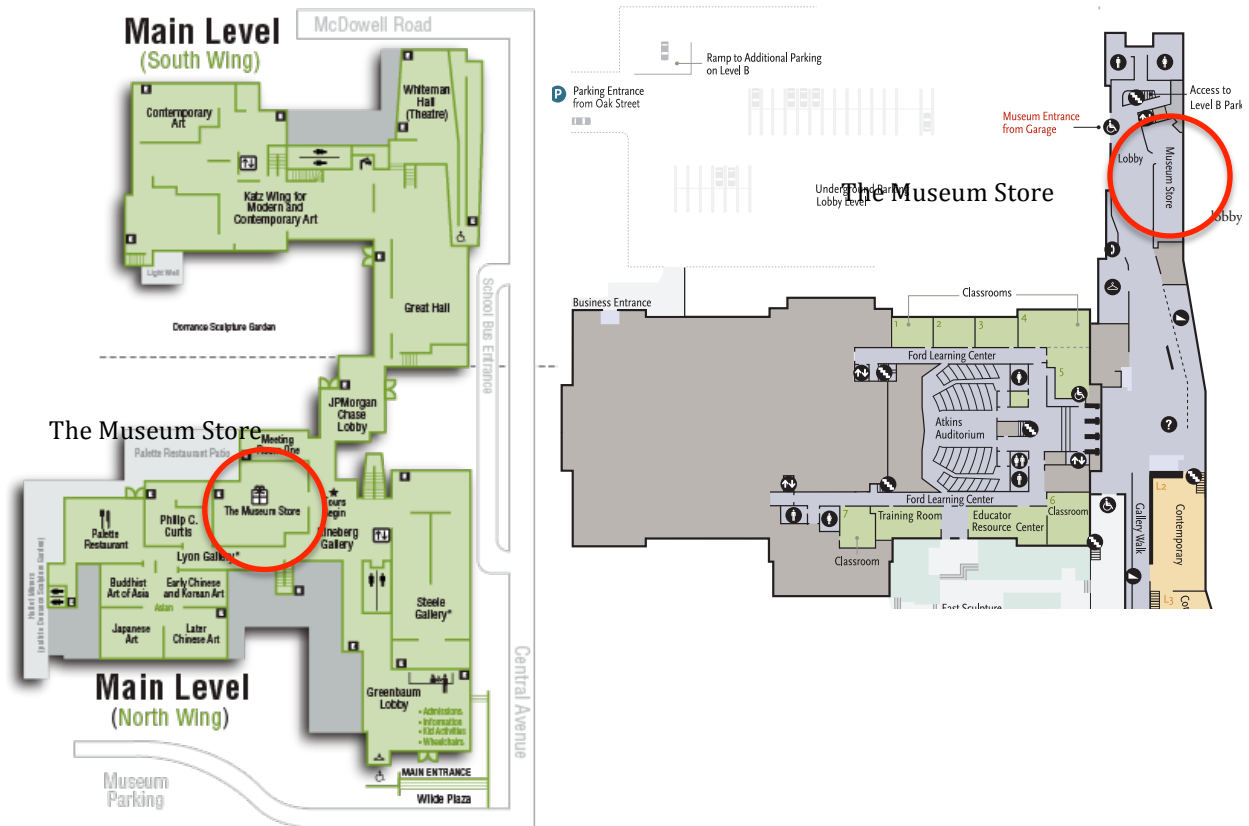


**Fig. 6.117 (left):** Location of two museum stores on the first floor and **Fig. 6.118 (right):** Location of the museum store on the second floor, in the Metropolitan Museum of Art. Images source: Met visitor map with infographics by author.

None of the three stores are visible from outside, therefore, external, street-level visibility was not a point of comparison in this case. There were differences, however, in the way they were located and connected internally, and this appeared to make a difference on their visitation. The smaller museum store on the first floor had 10 visitors in 10 minute span as compared to the small store on the second floor which had 22 visitors in the same amount of time. Being a type “a” space, the first was accessible only from the Great Hall and did not have more connections like the type “c” small museum store on the second floor which in addition to a main entry, was accessible via an additional set of stairs on the north side. The large museum store, was the most visited among the three with a count of 78

visitors in a 10 minute span, taken only at its main entry in the Great Hall. Besides being the largest store with a range of different sale items, it was also a well-connected, type “d” space with multiple entrances and exits on different sides. The sheer volume of visitors at the Met—the third most visited art museum in the world as discussed earlier—ensures that its museum stores are busy at all times, but the connectivity and location of stores at the Met clearly appeared to affect how many or how often visitors arrived at these stores either by intention or accident.

The museum store in the Phoenix Art Museum—a part of the 1996 addition, did not appear to be as popular with visitors. It was a type “a” space; its entry/exit is only through one set of doors inside the Rineberg gallery which is actually a connecting lobby between the North and South Wings. The lobby connections in this museum are quite problematic as discussed earlier; the Rineberg has no outside visibility at all and the museum store is invisible from the outside too. Its location is shown in the floor plan in figure 6.119 below. Visitors were observed to find it on their way to galleries in the North Wing or South Wing and did not spend much time in the store, perhaps also because of its limited selection of items. The plain electrical lighting inside did little to liven up the small museum shop. A small meeting room to its north—oddly located inside a very public part of the museum—unfortunately takes up a prime corner that would been ideal for bringing outside visibility, views, and daylight to the museum shop.



**Fig. 6.119 (left):** Location of the museum store on the first floor, in the Phoenix Art Museum. Image source: Phoenix Art Museum visitor map with infographics by author, and **Fig. 6.120 (right):** Location of the museum store on the lower level, in the Bloch building, Nelson-Atkins Museum. . Image source: Nelson-Atkins Museum visitor map with infographics by author.

The Museum store in the Bloch building in the Nelson-Atkins has similar issues of concern. As shown in figure 6.120 above, it was located off the entrance lobby to the garage of the lower-level because of which, it unfortunately *received no daylight in a building* that was known for its daylighting. It was a type ‘a’ space which did not appear to be as much of an issue as its floor location. This store could have benefitted much from being on the upper level—becoming more visible from the outside and inside, and receiving natural light and views.

### **Summary of key findings from the visitation study exercise:**

1. Space syntactic typology of art galleries indicating their level of connectivity in the museum layout is a useful tool and good indicator of how much they may be visited, however, visitation is influenced many other factors such as featured or special exhibitions on view in the galleries, the type of art on display and its popularity, and environmental attributes of the space such as light. If museum designers desire better levels of visitation for galleries and exhibits, they need to configure well-connected, accessible, and visible galleries in the floor layout. Signage and other necessary information should be clearly displayed. Text panels should be readable. Galleries that are well-sized, lit, and furnished with desirable amenities such as seating are also more attractive to visitors.
2. Admission fees have an impact on visitation. While this study only scratched the surface of this issue, it revealed potential for future studies to address. The findings also drew attention to the fact that museums do not provide enough information about gallery and exhibition closures to visitors who are still required to pay the full entrance fee. Art institutions need to start paying more attention to this need if they desire their patrons to return or make repeat visits over time. The bottom-line for visitors may be whether the price of an admission ticket is good value for money or not.
3. The comparative studies of stores in case studies found that just as art galleries, museum stores were popular and well visited if they were easy to find, well connected, and easily visible with good signage and wayfinding mechanisms. Revenues from stores assist museums in their daily operations and their location

and design have the potential to increase their visitation. Just as in other museum spaces, daylighting and outside views in museum stores have the potential to increase the levels of satisfaction and the amount of time that visitors spend in them.

## VII. CONCLUSIONS

Will the museum keep expanding by building more additions? The Director of Administration and Visitor Services at the Nelson-Atkins Museum, when confronted with this question, unfolded a map and drew his vision of the future for the institution. “We own all the houses and property one block north across the street. This property has great potential for future development 10-15 or 20 years from now.” The Bloch addition is only seven years old, but the need for another expansion is not surprising—only seven percent of the museum’s permanent collection is on display at any given time according to him. And acquisitions keep increasing, followed by a need for more programming. An idea of putting another wing on the Western edge—making the development more symmetrical or on the north outdoor court, after doing away with the reflecting pool—was discussed, but the Director felt that the parking below this level made it more complicated. Even if it made sense, developing the properties around the site could be moving in a more forward direction; new disconnected museum buildings instead of trying to physically attach them to the original would be more fruitful, according to him. There was no doubt in his mind, however, that the museum would expand in the near future.

Employees at the Phoenix Art Museum were not so certain what was next, but they gave hints that an addition was in the near future. One curator said:

We always wonder—and this also becomes part of the employee mindset—what’s next? There is nothing too serious yet, but things are being discussed. Expense is always a concern, but personally I would like to expand the North Wing.



His concerns were well-founded, since he managed a part of the permanent collection of that was all housed in the North Wing in galleries that were considerably smaller and more crowded with art than the South Wing.

At the Met, a remodeling of the exterior plaza with fountains and lighting at both sides of its front entrance on 5<sup>th</sup> avenue in Manhattan, New York, was already well underway at the time of the field visit and the plaza opened to the public on September 10, 2014. It is named for David H. Koch, a billionaire museum trustee who footed the \$65 million bill for this project. This may not be a building expansion in the classic sense, however, it is still an important extension of public space; the front porch of the museum—all some visitors may ever see. The Met's continuous affinity for building new additions over the years and the fact that it is always short on space for its artwork also leads one to believe that it will keep expanding in the future. The same goes for the Art Institute of Chicago. Currently, there is no indication in the news media if any of these museums are planning a new wing, but there is a strong possibility that we will see them materialize in the near future—either in the form of separate buildings located off-campus or physical building additions to the existing museum building (though this would be hard to accomplish since there is no more physical site area available for both museums).

As art collections and endowments keep increasing, it is inevitable that museums will keep expanding—with additions or new buildings, and instead of rejecting them completely, we must seek ways to keep improving them and making them better spaces for all occupants—employees included.

Summary of key findings

This study revealed that the front, public areas of museum additions may have many merits, but their workspaces need much improvement. An equal amount of thought and effort must be put into designing workspaces for museum employees—the workforce that essentially keeps the institution running everyday. The key findings of this study arising from each research method that was implemented, are summarized in table 7.1 below:

Summary of Key Findings

Study Method	Key Findings
Content analysis of critics’ reviews in the popular press (n = 100 articles)	Museum employees other than the Director and Trustees, were left out of critics’ reviews. Architecture and art were the dominant themes, while human factors, occupants perceptions, and experiences inside the building were rarely discussed. Discussions about financial concerns were restricted to the cost of constructing the new addition; changes to admission or membership fees and influences on employment numbers were not discussed.

Table 7.1 (continued on next page): Summary of key findings. Source: author.

Study Method	Key Findings
<p>Employee survey</p> <p>(n = 75 employee responses total, 49 employee responses from Nelson-Atkins Museum of Art, Kansas, MO, and 26 employee responses from Phoenix Art Museum, Phoenix, AZ )</p> <p><b>Survey highlights:</b></p> <ul style="list-style-type: none"> <li>• Employees had a positive opinion of the museum addition (mean score 6.3/7)</li> <li>• Employees felt that museum back spaces were somewhat worse than museum front spaces (mean score 3.2/7). They were only somewhat satisfied with their work spaces (mean score 4.91/7)</li> <li>• Spaces with daylight and views were the best to work in (80.39%)</li> <li>• Spaces without daylight were the worst to work in (50.98%)</li> <li>• Museum lobbies are the best public spaces (37.25%)</li> <li>• Circulation areas such as hallways and staircases, and older art galleries (not in new additions) are the worst public spaces (27.91%)</li> <li>• Wayfinding and accessibility are big concerns in the museum (30.19%)</li> </ul>	<p>New museum additions did not improve work conditions. Employees felt only neutrally towards or were somewhat satisfied with their work spaces. They were dissatisfied with the amount of daylight and views to the outside that were available—qualities that many public, front parts of the museum possessed. Many of them sat in windowless spaces and a large proportion of these were in basements, for reasons such as these, they felt that frontspaces of the museum overall, were much better than backspaces. They also felt that spaces with daylight were the best and those without were the worst parts of the museum, whether in the new addition or the old building. They mostly disagreed with critics’ negative reviews of the museum addition and agreed with their positive reviews. Most employees also felt that wayfinding problems, more so than any other aspect of the museum, needed to be fixed.</p>

**Table 7.1 (cont.)**

Study Method	Key Findings
<p>On-site observations and employee interviews in back spaces</p> <p>(n = 49 work spaces observed, 37 in the Nelson-Atkins Museum of Art and 12 in the Phoenix Art Museum)</p> <p>n = 10 employees interviewed, 5 in the Nelson-Atkins Museum of Art and 5 in the Phoenix Art Museum)</p>	<p>Observations confirmed survey results; most work spaces were windowless, and many were in basements. New building additions had improved conditions for the art, but not for employees.</p>
<p>On-site observations in front spaces</p> <p>(n = 180 art galleries observed in four museums, total)</p> <p>n = 58 public, non-gallery spaces such as lobbies, courtyards, atria, stores, stairways, ramps, and cafes observed in four museums, total)</p>	<p>Wayfinding, circulation, and accessibility were problematic in all four museums, just as employees from two museums had pointed out in the survey. Museum shops and cafes worked well only if they were easily visible and/or easy to find. The Met and the Art Institute did little to address museum fatigue; the Nelson-Atkins Museum and Phoenix Art Museum made an attempt to do so, and were partially successful in countering its effects. These two smaller museums were also more successful in engaging the site with outdoor spaces than the two larger ones. Daylight greatly increased the ambience and mood in art galleries and common spaces, but in a few instances it was inadequately controlled, resulting in visual discomfort.</p>
<p>Illuminance measurements in back spaces</p> <p>(n = 49 work spaces measured total, 37 in the Nelson-Atkins Museum of Art and 12 in the Phoenix Art Museum)</p>	<p>Illuminance levels in most offices met recommended standards and were not the cause of employee dissatisfaction with lighting and their overall work spaces. Employees were dissatisfied with other attributes such as the lack of windows and privacy per the survey. A few offices with daylighting had excessive illuminance levels and glare resulting in visual discomfort.</p>

**Table 7.1 (cont.)**

Study Method	Key Findings
<p> <b>Illuminance measurements in front spaces</b>             (n = 180 art galleries measured in four museums total             n = 58 public, non-gallery spaces such as lobbies, courtyards, atria, stores, stairways, ramps, and cafes measured in four museums total)         </p>	<p>           Most art galleries met illuminance levels suitable for art conservation but many did not meet accessibility requirements. Some courtyards, circulation, and gathering spaces in the Met and Art Institute had light levels that jumped off the charts because of direct daylight, resulting in excessive glare and visual discomfort.         </p>
<p> <b>Visitor counts and space syntactic typology</b>             (n = 124 galleries observed in four museums, total)         </p>	<p>           Selected art galleries in all four museums were assigned space syntactic typologies of a, b, c, and d based on where they were located in the museum layout. An <i>a-space</i> is a dead-end occupation space with no movement potential, a <i>b-space</i> has more than one connection but lies on the way to a dead end, a <i>c-space</i> is 2-connected and on at least one ring so that we have one alternate return route, and a <i>d-space</i> is 3+-connected and on at least two rings. Syntactic typologies of art galleries were found to have a significant influence on gallery visitation in large museums (Met and the Art Institute) but not in the smaller museums (Nelson-Atkins and Phoenix Art Museum). Wayfinding, connectivity, accessibility, special exhibitions and blockbuster shows, methods of dispensing information to the public, and admission policies have an influence on visitation in all four museums.         </p>

**Table 7.1 (cont.)**

### **General recommendations for new museum additions**

This post-occupancy study of museum additions provided useful insights and ultimately led to general recommendations for future, new museum addition buildings to inform museum decision-makers and designers. These recommendations directly respond to the research

questions in the Research Statement chapter and are presented in the same order and structure:

1) General recommendations for front stage spaces in new museum additions (impacting both museum visitors and employees):

- **Make spaces easily accessible and improve wayfinding throughout the museum.** Accessibility concerns can be addressed by avoiding many level changes on each floor of the building and providing adequate elevators for vertical circulation instead of long ramps where level changes are unavoidable. Wayfinding recommendations include providing adequate signage with text and graphics that are easy to read, providing information desks at various locations throughout the museum for museum personnel to respond to visitor queries and give directions if necessary.
- **Give serious consideration to the effects of museum fatigue.** Fatigue in this study, was found related to the provision of public amenities, wayfinding, connectivity, and accessibility issues. Improvements in these areas, will ultimately lead to greater visitor satisfaction—they will tend to return more often, increasing attendance numbers and revenue for the museum which pays for a big chunk of its daily operations in additions to endowments and governments subsidies. Some museums are trying to improve in these areas, however, there needs to be a bigger push to find ways to alleviate museum fatigue, also commonly known as “museum feet” or “museum legs” in museum circles.

- **Provide adequate, well-designed restrooms that are easy to locate.** The museums studied, particularly the two large ones—the Met and the Art Institute, lacked adequate restroom facilities for their visitors. In addition, they were hard to find, and seldom located in central spaces such as lobbies. They also had the potential for being more accessible, gender equitable, family-friendly, and elder-friendly. Designers must go above and beyond code requirements to plan comfortable and adequate restroom facilities for all user groups.
- **The bottom-line for the museum visitor: Does the admission ticket price represent good value for money?** This should be a key question that museums must keep asking themselves as they continue to evolve. The lack of adequate amenities such as water fountains and seating, toilets that are hard to find, and signs that are hard to read or understand can be just as upsetting for the visitor, as a gallery with a famous work of art that is temporarily closed. Museums must work harder to provide adequate facilities for visitors to be comfortable and satisfied during their visit.

2) General recommendations for back stage spaces in new museum additions (impacting museum employees):

- **Invest in employee work environments.** The fund raising plan for upgrades or new museum wings should include upgrading existing work spaces or moving them to offices in the new building. Instead of implementing an hierarchical order when planning new offices, all employees should be provided with healthy work environments instead; results show that even an access to a window with daylight

and views can impact workers' satisfaction levels positively which in turn can influence their health and productivity (Heerwagen, 1998; Stone, 1998).

- **Conduct more internal post-occupancy studies of non-public spaces in the museum.** Museums monitor visitor attendance, how, and where visitors move throughout the museum all the time (as per employee feedback and observations). Most gallery attendants and security guards were, in fact, always observed to be counting visitors in galleries by means of hand-held clickers. Based on employee feedback received, it does not appear, however, that museum administrators or museum designers conduct post-occupancy evaluations of employees in the non-public parts of the museum. As findings indicate, these are parts that are always the most neglected in the building for renovations or remodeling.
- **Look at the big picture: What are the goals for the overall museum environment?** Museum administrators tend to view additions or wings as separate, isolated buildings on their own without realizing that every addition changes the entire building. They should aim to provide visitors with a singular memorable experience, instead of a series of disconnected narratives. We need to avoid the “Frankenstein effect of museum additions”, one museum curator said; the act of adding bits and pieces here and there.
- **Identify these goals in early stages of planning.** Design is not a linear process but outlining aims and objectives in the beginning provides the museum board and architects with a clear vision and directive. “Massive problems need massive solutions” was an often repeated phrase by museum employees who were surveyed. With additions, buildings increase in size and complexity, creating the need for more



infrastructure—such as building systems and amenities. This infrastructure needs to be taken into account and planned for from the very beginning; lessons learned from post-occupancy evaluations of the building need to be implemented in the design of future additions.

3) General recommendations new museum addition architecture (impacting museum layout, aesthetics, quality, identity, and image, for visitors, employees, residents, and critics):

- **How does new addition architecture bridge the gap between past and the present?** A majority of the additions studied in this dissertation were modern, contemporary wings tacked on to older, neo-classical buildings (the older Beaux-Art facade of the Met on Fifth Avenue in New York City by architect Richard Morris Hunt dates back to 1902). Feedback from museum staff, critics' reviews, and the public opinion, however did not reveal this type of architectural vocabulary and juxtaposition to be problematic. The main challenges, as this study revealed, lay with creating optimal environments to display art and establishing connections between the old and new structures so that they functioned as almost as one building on the inside, with easily accessible routes, good way finding mechanisms, and adequate public amenities. Architects need to put the same emphasis on these areas as they do on architectural form, aesthetics and style, when designing new museum additions.
- **Should the new building for art or for architecture?** It does not have to be one or the other. Art and architecture can successfully co-exist in an equal dialogue and the

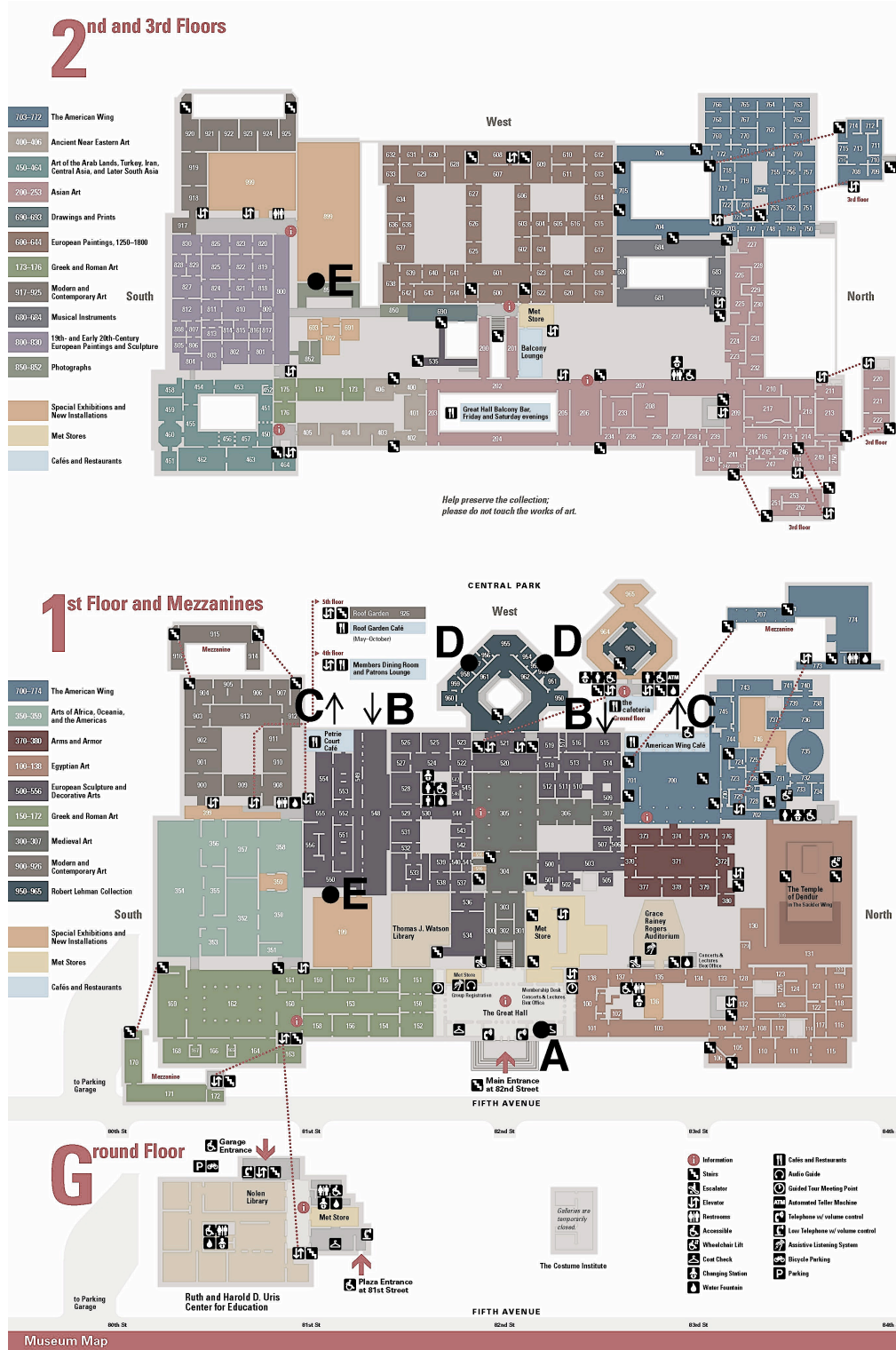
buildings or parts of the museums that achieved this balance appeared to be the most successful ones.

- **Size matters.** The Met and the Art Institute, as findings revealed, may have become too big with all their various expansions over the 20<sup>th</sup> and 21<sup>st</sup> century. At two million and one million square feet of floor area respectively, they appear to be at breaking point as far as wayfinding and accessibility is concerned and this in turn negatively impacts occupant comfort and satisfaction. This leads us to believe that after reaching a certain size, museums may simply become too big. In this respect, the Nelson-Atkin's Director of Administration's vision for the future may be on the right track: separate museum buildings that are built off-site may work better as compared to a single large building that struggles to function and keep up standards of the occupant experience as it keeps getting bigger. While this study did not investigate what the optimum size could be or if there was an optimum size at all, this may be a direction worth pursuing for future research.
- **Design daylighting strategies to address user needs, art conservation and viewership, with careful attention to technical detail.** Daylighting influenced employees' satisfaction levels and created suitable environments for visitors to view art, move around, or rest; this finding was evident in back and front spaces of the museum. Introducing daylight usually raises serious art conservation concerns in art galleries, but as architect Steven Holl has demonstrated in the Bloch building of Nelson-Atkins, it can work if managed carefully. All these factors make daylighting worthwhile—the key is finding the right balance between conservation, visual comfort, accessibility, and desired ambience.

## **Design recommendations for the four museum case studies**


The findings of this research also led to some design recommendations for each of the four museums that were studied. These recommendations do not address every finding of this study; they present possible improvements for existing conditions and solutions for some key issues of concern in the museums. Suggested changes are shown for each museum via annotated floor plans followed by a brief description of each recommendation.

**The Metropolitan Museum of Art, New York, NY**




**Fig. 7.1:** Ground, first, mezzanine, second, and third floor layouts of the Metropolitan Museum of Art with annotations. Source: The Met Museum map, with infographics by author.

## Design recommendations for the Metropolitan Museum of Art, New York, NY

Plan Mark	Recommendation
<b>A</b>	Provide a restroom in the Great Hall—which is the main entrance lobby for visitors—as shown. Also provide at least one restroom block in each wing at every level. Provide a family/accessible restroom in addition to male and female restrooms. Provide a water fountain—at least one accessible and one standard—outside each restroom unit. Provide benches along walls outside restrooms.
<b>B</b>	Provide entrances/exits to/from Central Park on the west at these locations, with security, ticketing, and coat check-in facilities.
<b>C</b>	<p>Create outdoor spaces for existing cafes on the lawn in Central park adjacent to museum on the west side, through glazed doors. This space can also function as an outdoor sculpture garden. Figures 7.2 and 7.3 below show how the adjacent Central Park lawn would look before and after these changes are implemented.</p> <p><b>Central Park lawn outside the Met on its west side <u>before</u> proposed changes (unused lawn, no access from Central Park side)</b></p>  <p><b>Fig. 7.2:</b> Central Park lawn outside Met before proposed changes (in its current state). Source: Photo by author.</p>

**Table 7.2 (continued on next page):** Design Recommendations for the Metropolitan Museum of Art. Source: author.

	<p><b>Central Park lawn outside the Met on its west side <u>after</u> proposed changes (outdoor café seating and lawn, access from Central Park, and sculpture garden)</b></p>  <p><b>Fig. 7.3:</b> Central Park lawn outside the Met after proposed changes. Source: Photo with added graphics by author.</p>
<b>D</b>	<p>Create high windows with light shelves (which can deflect light deeper and more uniformly) to bring daylight into the galleries (numbers 950-962) in the Lehmann Wing on the ground floor. Figures 7.4 and 7.5 below show how a typical gallery in the Lehmann Wing on the ground floor would look before and after these changes are implemented.</p> <p>Note that this change may require some re-grading of the site adjacent to the Met on its west side in Central Park—perhaps even in the form of a small light well—since this level of the Lehmann Wing is probably below the grade level in Central Park. Since the windows will be situated high from the floor finish level on the interior, however, the light well will not need to be very deep.</p>

**Table 7.2 (cont.)**



**D**

**Lehmann Wing art gallery on the ground floor in the Met before proposed daylighting design (no windows)**



**Fig. 7.4:** Lehmann Wing art gallery on the ground floor in the Met before proposed changes (in its current state). Source: Photo by author.

**Lehmann Wing art gallery on the ground floor in the Met after proposed daylighting design (with high windows)**



**Fig. 7.5:** Lehmann Wing art gallery on the ground floor in the Met after proposed changes. Source: Photo with added graphics by author.

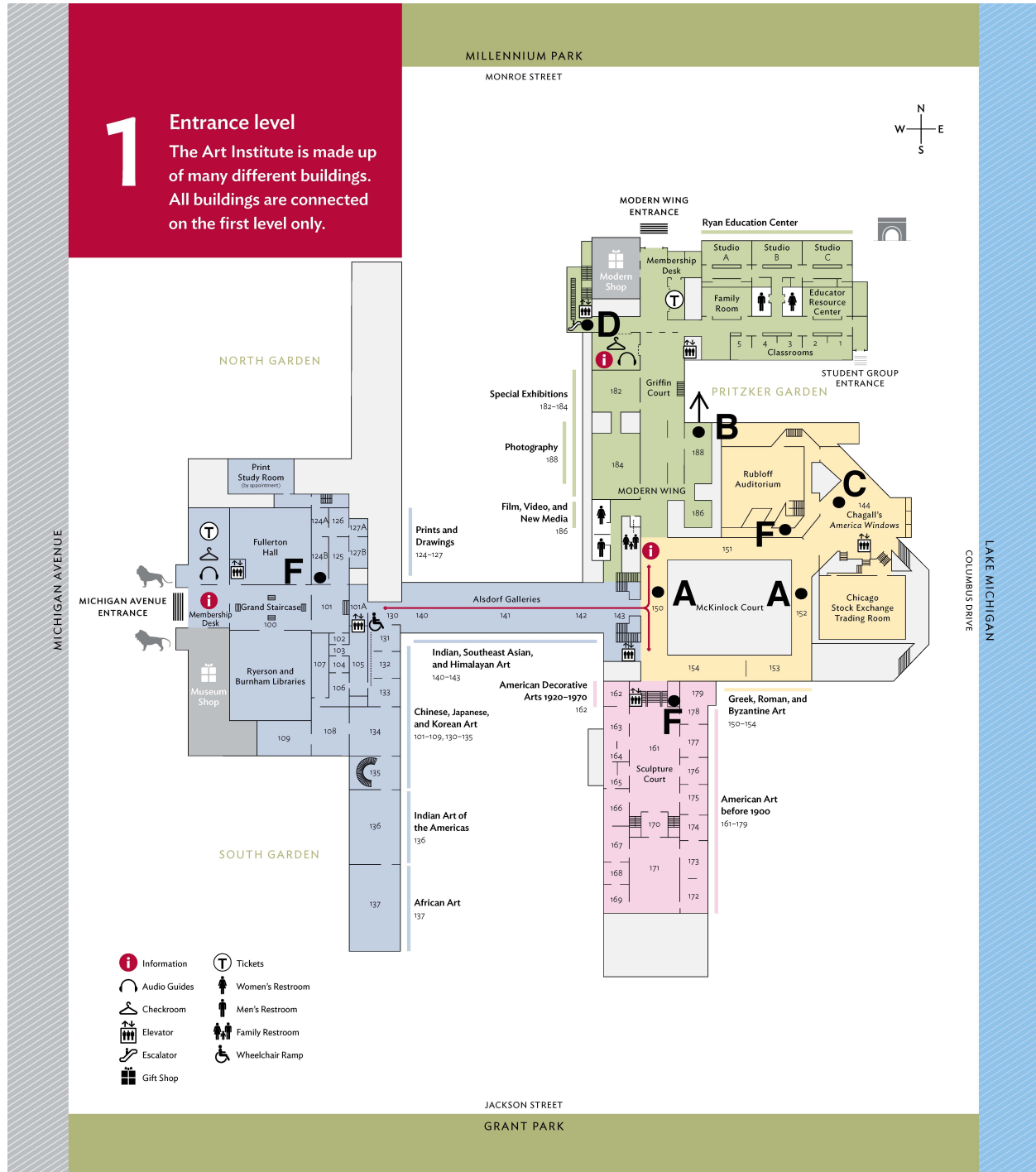
**Table 7.2 (cont.)**

<b>E</b>	Connect special exhibition gallery 199 on the first floor to special exhibition gallery 899 on the second floor via internal stairways and elevators in this location. Use these two galleries for special exhibitions that require two levels instead of galleries in other parts of the museum that are disconnected and far away from each other.
<b>In all galleries</b>	Provide at least two or three benches in each gallery and more in larger galleries. Put benches in locations that are well lit and with a good view of the art; avoid corners and dark alcoves. Benches should have armrests, be at least 18 inches high, and have adequate space on the sides for exhibition literature and personal belongings.

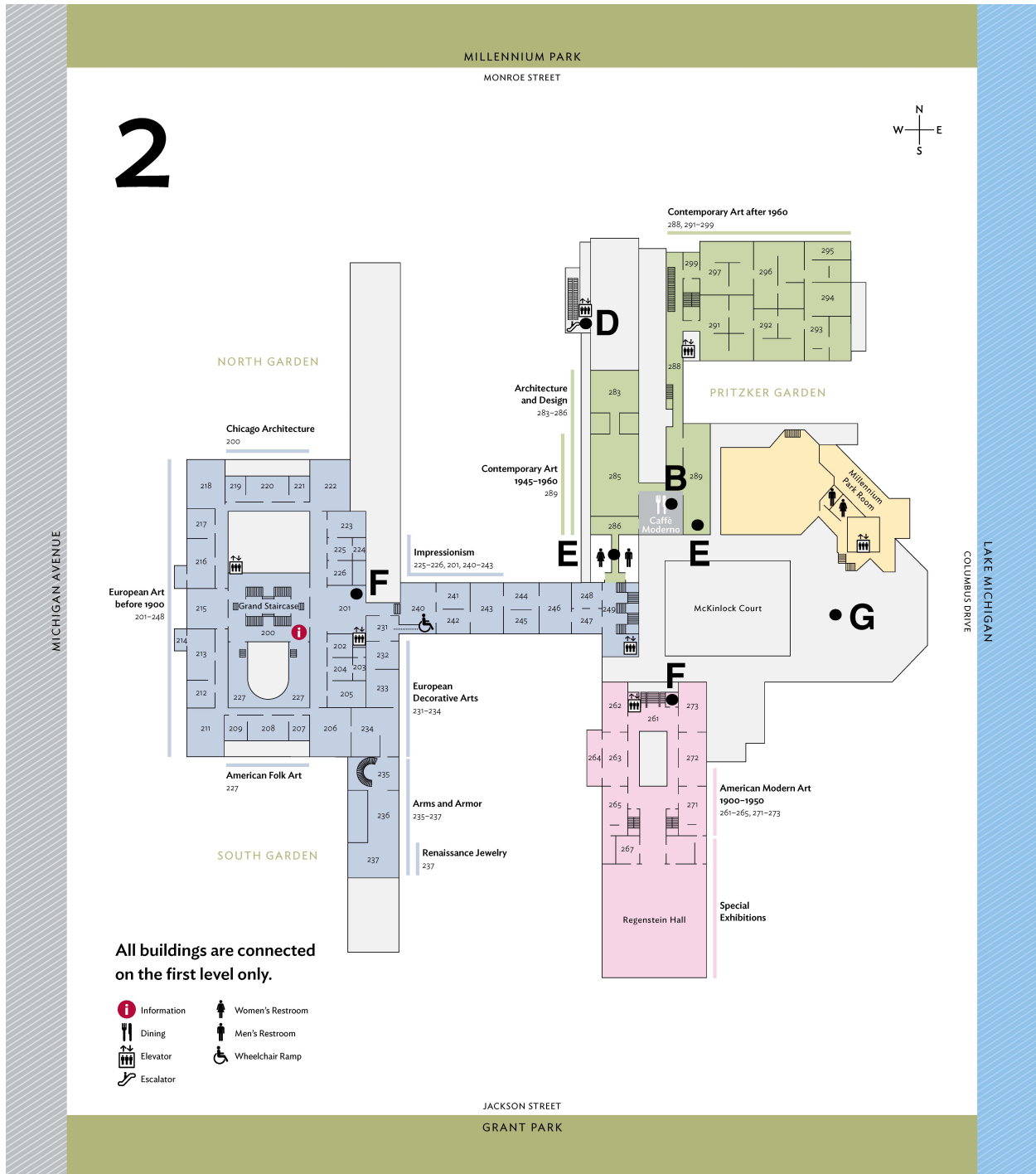
**Table 7.2 (cont.)**



# The Art Institute of Chicago, Chicago, IL



**Fig. 7.6:** First floor layout of the Art Institute of Chicago with annotations. Source: The AIC Museum map, with infographics by author.



**Fig. 7.7:** Second floor layout of the Art Institute of Chicago with annotations. Source: The AIC Museum map, with infographics by author.

## Design recommendations for the Art Institute of Chicago, Chicago, IL

Plan Mark	Recommendation
<b>A</b>	Consider reducing some of the permanent art work on display Greek, Roman, and Byzantine art galleries (150 - 154) around McKinlock Court, on the first floor level. Fewer objects can be rotated more frequently if desired, thereby freeing up circulation space around McKinlock Court on the first floor. These galleries lie at a crucial location, currently forming the only connection between Gunsaulus Hall to the west, the Modern Wing to the north, the Rice Building to the south, the Rubloff Building to the northeast, and the Columbus Drive additions to the east.
<b>B</b>	Move Caffè Moderno, which is currently on the second floor in the Modern Wing, into gallery 188, on the first floor of the Modern Wing. Currently, 188 is a photography gallery that is not as well-visited as others in the Modern Wing. Photography exhibitions can easily be accommodated in special exhibitions gallery 182 as well as in the space freed up by the moving the existing café from the second floor. Moving the café from the second floor and creating a photography gallery in this space will also create a better connection into the contemporary art, architecture and design galleries that lie adjacent to it. Further, having the café on the first floor in gallery 188, will give opportunities to open out onto Pritzker Garden which is currently underused. When weather conditions permit, visitors could sit and have their meals purchased from Caffè Moderno outside, in Pritzker Garden. Figures 7.7 and 7.8 below show how the Pritzker Garden in the Modern Wing would look before and after these changes are implemented.

**Table 7.3 (continued on next page):** Design Recommendations for the Art Institute of Chicago. Source: author.

**B**

**Pritzker Garden in the Modern Wing, Art Institute of Chicago before proposed changes (unused dead space)**



**Fig. 7.8:** Pritzker Garden in the Modern Wing, Art Institute of Chicago before proposed changes (in its current state). Source: Photo by author.

**Pritzker Garden in the Modern Wing, Art Institute of Chicago after proposed changes (active outdoor café area and sculpture garden)**



**Fig. 7.9:** Pritzker Garden in the Modern Wing, Art Institute of Chicago revitalized after proposed change. Source: Photo with added graphics by author.

**Table 7.3 (cont.)**

<p><b>C</b></p>	<p>Gallery 144 (Chagall’s America Windows) in the East Wing requires significant upgrades to its interior with regards to finishes. Currently, the finishes look dull. Change the floor finish to wood, to match the adjacent galleries and the Modern Wing. Also, introduce daylight to liven up this space via high windows through the exterior wall on the east.</p> <p>Note that the exhibit Chagall’s America Windows was originally located in 1977 on the main level in a spacious area overlooking the west side on McKinlock Courtyard. It was then moved in 2005 to avoid damage during the construction of the Modern Wing (Isaacs, 2011). In November 2010, this exhibit reappeared, but not in its original location. “An Art Institute press release announced that, “following an intensive period of research and conservation treatment,” the windows would return to public view as “the stunning centerpiece of a new presentation of public art in Chicago on the east side of the museum’s Arthur Rubloff building.”.... If you haven’t seen that “new presentation” yet, you might want to brace yourself. Tucked into an alcove adjacent to what used to be the museum’s back door, the celebrated America Windows now function as lobby art for the Rubloff Auditorium. The foyer of the recently shuttered Columbus Drive entrance—a zone defined by a bank of locked glass doors, an oppressively low ceiling, and a sterile, high-gloss white floor—is the new setting for what the museum still refers to as “Chagall’s masterpiece.” (Isaac, 2011, p.1).</p>
<p><b>D</b></p>	<p>Provide better signage and information for visitors to get to the Terzo Piano restaurant on level 3 (roof level) after entering the Modern Wing from Monroe Street on the north. Provide an escalator going up to the restaurant, so that there are two escalators operational in both directions at all times (There is currently only one escalator moving in the downward direction, from the restaurant to the first floor, resulting in cramped elevators and waiting lines to go to the top). Also, put a large sign at the low end of the Nichols bridgeway that is situated in the Great Lawn of Millennium Park, directing visitors to the Terzo Piano restaurant. Figures 7.9 and 7.10 below show how connection to the Terzo Piano restaurant on level 1 inside the Modern Wing would look before and after these changes are implemented.</p>

**Table 7.3 (cont.)**

**D**

**Level 1 connection to Terzo Piano restaurant in the Modern Wing, Art Institute of Chicago before proposed changes (only one escalator and a small sign)**



**Fig. 7.10:** Level 1 in the Modern Wing, Art Institute of Chicago before proposed changes (in its current state). Source: Photo by author.

**Level 1 connection to Terzo Piano restaurant in the Modern Wing, Art Institute of Chicago after proposed changes (additional escalator and clearly visible signage)**



**Fig. 7.11:** Level 1 in the Modern Wing, Art Institute of Chicago revitalized after proposed change. Source: Photo with added graphics by author.

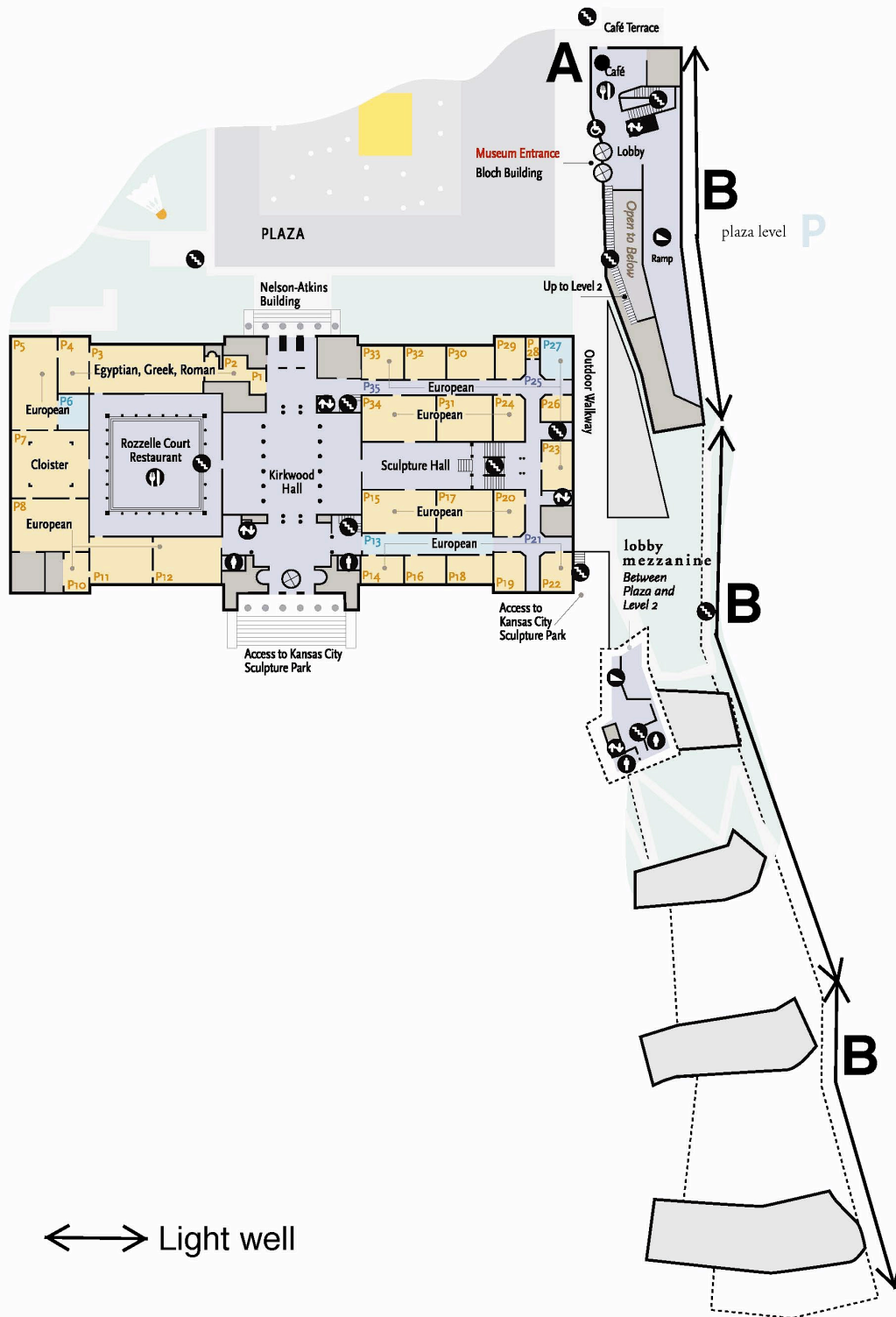
**Table 7.3 (cont.)**

<b>E</b>	The connecting corridor between Impressionism and European Galleries (galleries 240-249) and the Design gallery 286 on the second floor is narrow, with restrooms on both sides. Relocate restrooms to the corner of gallery 289 as indicated, thereby widening gallery 286 and its connection to galleries 240-249 considerably.
<b>F</b>	Provide additional restrooms in these locations on the first and second floors. Restroom block must have a separate family/accessible restroom in addition to male and female, water fountains – one accessible and one regular, and benches outside.
<b>G</b>	Proposed option for future expansion: Current site constraints do not leave much room for the Art Institute to physically expand. The School of the Art Institute (SAIC) is currently situated in the east wing of the museum, next to Columbus Drive. For future expansion, the school could be taken over by the museum for additional art gallery space after being relocated to a property in the vicinity or across Michigan Avenue.
<b>In all galleries</b>	Provide at least two or three benches in each gallery and even more in larger galleries. Put benches in locations that are well lit and with a good view of the art; avoid corners and dark alcoves. Benches should have armrests at both ends and adequate space on the sides for exhibition literature and/or personal belongings.

**Table 7.3 (cont.)**

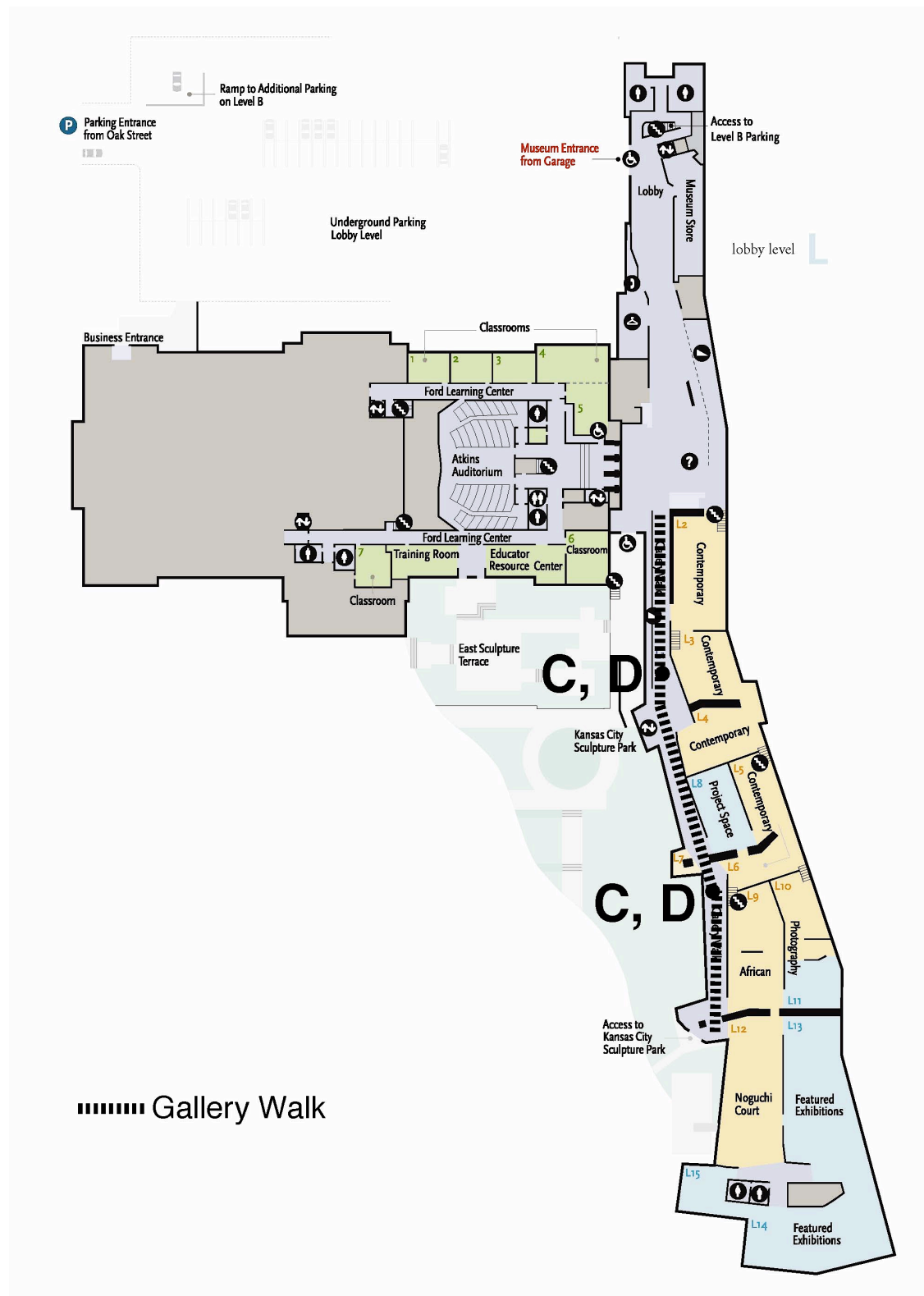


## Nelson-Atkins Museum of Art, Kansas City, MO



**Fig 7.12:** Plaza level layout of the Nelson-Atkins Museum of Art with annotations. Source: The Nelson-Atkins Museum of Art map, with infographics by author.





**Fig. 7.13:** Lobby level layout of the Nelson-Atkins Museum of Art with annotations. Source: The Nelson-Atkins Museum of Art map, with infographics by author.

Design recommendations for the Nelson-Atkins Museum of Art, Kansas City, MO



Plan Mark	Recommendation
A	<p>Convert the Creative Café in the north corner of the Bloch Building on the plaza level into a Children’s gallery, similar to one in the Phoenix Art Museum. This gallery will be at an ideal location at the corner of the Bloch, adjacent to the main museum entrance at the plaza level. It will have great visibility from the plaza on the west and E. 45<sup>th</sup> Street to the north,. Nelson-Atkins is popular with families with children in the local community and also for school visits, therefore, a children’s gallery will be a good fit for this space which is currently underused and empty most of the time. Note that a children’s gallery (known as PhxArtKids) has been very successful in the Phoenix Art Museum and the same model could be used here. Figures 7.13 and 7.14 below show how the Creative Café would look before and after these changes are implemented.</p> <p><b>Bloch building Creative Café before proposed changes (unused café space with vending machines)</b></p>  <p><b>Fig. 7.14:</b> Creative Café in the Bloch building, Nelson-Atkins Museum before (in its current state). Source: Photo by author.</p>

Table 7.4: Design Recommendations for the Bloch Building, Nelson-Atkins Museum of Art. Source: author.

	<p><b>Bloch building Creative Café <u>after</u> proposed changes (revitalized as a Children's Gallery)</b></p>  <p><b>Fig. 7.15:</b> Creative Café in the Bloch building, Nelson-Atkins Museum after proposed changes. Source: Photo with added graphics by author.</p>
<b>B</b>	<p><u>Option 1) High-cost solution, with extensive construction:</u> Create a light well all along the eastern edge of the Bloch Building to bring daylight into the B-level (basement) employee work spaces. This light well could also provide daylight to the museum store on the lobby level. An existing light well near the north business entrance which provides natural light and views to staff offices on the lower level of the older Nelson-Atkins building is a good precedent for employing this strategy on the museum campus.</p> <p><u>Option 2) Alternative, lower-cost solution, without extensive construction:</u> Provide two or more employee break rooms at different locations along the B-level ramp in the basement. Install artificial light fixtures that are known to provide some of the benefits of daylight by replicating the daylight spectrum (in intensity and color) in these rooms. Provide comfortable furniture to relax, and gathering spaces to eat or have informal meetings in these break rooms. Also look into providing these types of light fixtures in employee offices and workspaces if desired by staff.</p>

**Table 7.4 (cont.)**

C	Provide more benches along the gallery walk—one at every 50 feet (even if some the art needs to be removed to create space)—to provide visitors with much needed stopping and resting points in the Bloch Building.
D	<p>High-cost solution, with extensive construction that may no longer be <u>feasible</u>: Make the Gallery Walk completely level throughout its length. Raise the floors of all adjacent galleries to the same level along the walk. The lenses can still vary in form and height according to the natural slope of the site. Provide access to the outdoor sculpture park and gardens via ramps at two or three locations (starting, midpoint, and endpoint) at the gallery walk. Situate these ramps outside the building.</p> <p>This change is crucial for fixing some of the problems associated with the long (approximately 450 feet) Gallery walk in the Bloch Building, that were discussed in detail earlier. It may, however, no longer be possible without significant demolition and rebuilding effort; it should ideally have been incorporated into the layout during the schematic design phase of the project. Figures 7.15 and 7.16 below show how the Steele gallery would look before and after these changes are implemented.</p> <p><b>Bloch building Gallery Walk <u>before</u> proposed changes (with slopes throughout its length)</b></p>  <p><b>Fig. 7.16:</b> Gallery Walk in the Bloch building, Nelson-Atkins Museum before (in its current state). Source: Photo by author.</p>

**Table 7.4 (cont.)**

**Bloch building Gallery Walk after proposed changes (level with no slope throughout its length, more benches and art)**



**Fig. 7.17:** Gallery Walk in the Bloch building, Nelson-Atkins Museum after proposed changes. Source: Photo with added graphics by author.

**Table 7.4 (cont.)**

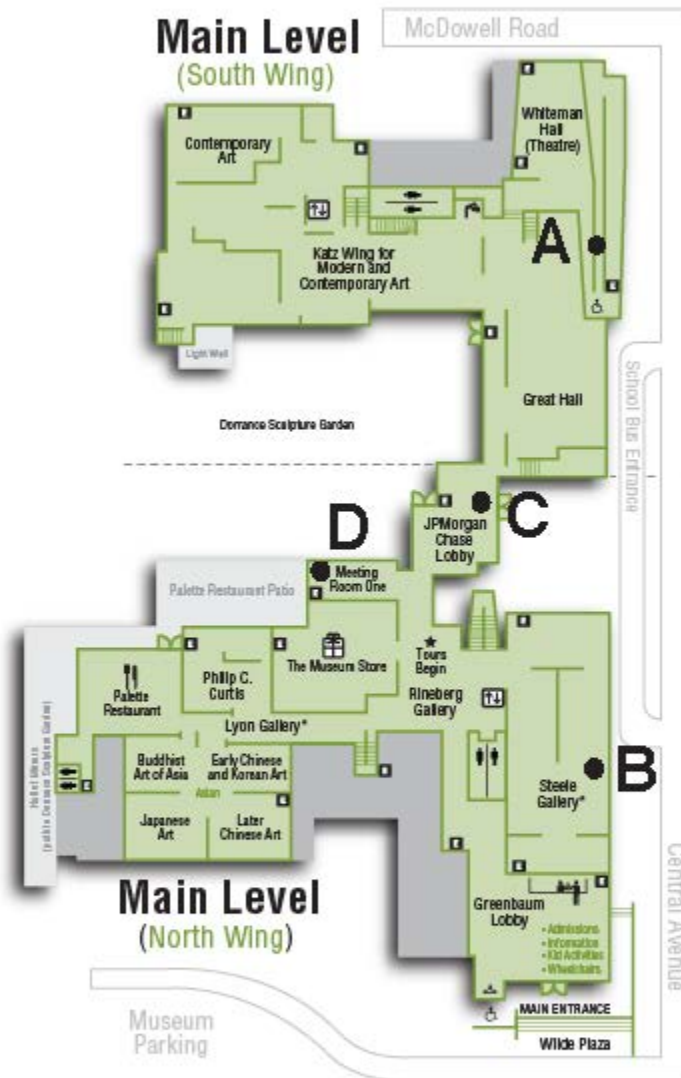


## Phoenix Art Museum, Phoenix, AZ

### Lower Level (South Wing)



### Main Level (South Wing)



**Figs. 7.18 (top) and 7.19 (bottom):** Partial Lower level layout in South Wing(top) and Main level layout (bottom) of the Phoenix Art Museum with annotations. Source: Phoenix Art Museum map with infographics by author.



**Fig. 7.20:** Mezzanine level layout in the South Wing of the Phoenix Art Museum with annotations. Source: Phoenix Art Museum map, with infographics by author.

### Design Recommendations for the Phoenix Art Museum, Phoenix, AZ

Plan Mark	Recommendation
<b>A</b>	Remove existing ramp between the Great Hall on the first floor and the Modern Art gallery on the mezzanine. Provide an elevator next to the stairs and use the space freed up by the ramp for exhibits at first floor and mezzanine levels.
<b>B</b>	Introduce daylight into the Steele Gallery—the special exhibitions space on the first floor, via top lighting strategies such as skylights or roof monitors and add more benches for visitors; same as the newer ones in the American and European Art Galleries on the second floor. Figures 7.20 and 7.21 below show how the Steele gallery would look before and after these changes are implemented.

**Table 7.5 (continued on next page):** Design Recommendations for the Bloch Building, Nelson-Atkins Museum of Art. Source: author.

**B**

**Steele Gallery before proposed changes (no daylighting, few benches)**



**Fig. 7.21:** Steele Gallery in the Phoenix Art Museum before (in its current state). Source: Photo by author.


**Steele Gallery after proposed changes (daylighting via roof monitors, more benches)**




**Fig. 7.22:** Steele Gallery in the Phoenix Art Museum revitalized after proposed changes. Source: Photo with added graphics by author.

**Table 7.5 (cont.)**



<p><b>C</b></p>	<p>Provide an information desk with staff in the Chase Lobby. Also, make this the new starting point for docent tours. This location is more central and easy to find, compared to the current meeting place in the Rineberg gallery. The Chase Lobby is also the current entry point for school visits, so it is an ideal meeting spot.</p>
<p><b>D</b></p>	<p>Remove 'Meeting Room One' next to the museum store on the first floor. Expand museum store into this space, and introduce daylight and views of the sculpture garden via windows on the exterior walls. Provide glazed exit doors onto the neighboring Palette Restaurant Patio for visitors to easily move between both spaces and look at the window displays of the museum store while sitting on the patio. Figures 7.22 and 7.23 below show how the Museum Store would look before and after these changes are implemented.</p> <p style="text-align: center;"><b>Museum store <u>before</u> proposed changes (no windows or views)</b></p>  <p><b>Fig. 7.23:</b> Museum store in the Phoenix Art Museum before (in its current state). Source: Photo by author.</p>

**Table 7.5 (cont.)**

<p><b>D</b></p>	<p><b>Museum store <u>after</u> proposed changes (fully glazed wall on south side looking onto sculpture garden and outdoor café area)</b></p>  <p><b>Fig. 7.24:</b> Museum store in the Phoenix Art Museum after proposed changes. Source: Photo with added graphics by author.</p>
<p><b>E</b></p>	<p>Provide more benches in the lower level Contemporary Art and Marshall Art galleries. A lot of the space in these galleries is currently unused; display more art from the permanent collection or hold more special, temporary exhibitions, with additional partitions to divide up the space if necessary.</p>
<p><b>In all galleries</b></p>	<p>Change bench design in all galleries to be same as the newer ones in the European and American galleries on the second floor. Put portable seats in a visible location with adequate signage and directions for visitors, outside galleries.</p>

**Table 7.5 (cont.)**

## **Concluding remarks**

All post-1970 additions in the four museums were bold, confident works of architecture by renowned architects and these works brought with it, new opportunities for people. “The architecture is relatively simple,” said Kevin Roche, architect of the eight post-1970 additions at the Metropolitan Museum of Art, “...the human aspect is always more complicated.” (Pogrebin, 2007, p. E1). The complexities of the human aspect, have unfortunately, not been addressed in these art museum additions. With new additions, come new problems, and this study aims to serve as a catalyst for change. It challenges various decision-makers—administrators, architects, designers, etc.—to do better, and they can certainly do better, as the findings of this research reveal. The state of the occupants needs the same attention as the state of the art.

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## IX. APPENDICES

### Appendix A: Sample introduction letter to museums

UNIVERSITY OF ILLINOIS  
AT URBANA-CHAMPAIGN



#### School of Architecture

117 Temple Hoyne Buell Hall, MC-621  
611 Taft Drive  
Champaign, IL 61820-6921 USA

November 21, 2013

Mr. Thomas Weymouth, Executive Assistant to the CEO  
The Nelson-Atkins Museum of Art  
4525 Oak St, Kansas City, MO 64111

Dear Mr. Weymouth:

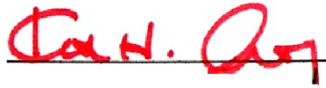
Could you please grant us access to the Nelson-Atkins Museum of Art to conduct a research study assessing the impact of museum additions on visitors' and employees' perceptions and experiences? Our research project *"More Than Meets the Eye: The Design of "Starchitect" Museum Additions and Their Impact on Occupants' Experiences"* is supported by a grant from the Campus Research Board and approved by the Institutional Research Board at the University of Illinois at Urbana-Champaign (UIUC). Our research endeavors to study the building additions of three premier art museums in the US—the Nelson-Atkins Museum of Art, the Met and the Art Institute of Chicago. We request your permission to conduct the following research activities at the Nelson-Atkins Museum of Art:

- 1) Conducting an online survey of museum employees. We have prepared a draft survey research instrument and would also welcome the opportunity for you to include specific issues of interest. Participation will be voluntary and participant information in the survey will be kept strictly confidential.
- 2) Taking lighting measurements with a portable hand-held light meter in public areas and employee workspaces as permitted by the museum.
- 3) Making observations and taking notes in all public areas of the museum. No visitors or museum employees will be approached or asked any questions as part of this exercise.

Results from this research will help develop human-centric guidelines for evidence-based museum addition designs. They will be shared with each participating museum. All museums that grant us access will be acknowledged in any publication resulting from this study. We would like an opportunity to discuss this project with you. Please respond to Altaf Engineer at 217-721-0955 or

via email at [aenginee@illinois.edu](mailto:aenginee@illinois.edu). We will contact you to follow up, and we look forward to hearing from you.

Thank you.



Professor Kathryn H. Anthony, PhD.



Altaf Engineer

ACSA Distinguished Professor  
Student

Graduate Research Assistant, Doctoral

Enclosure: Abstract of research proposal

### Abstract

#### **More Than Meets the Eye:**

#### **The Design of “Starchitect” Museum Additions and Their Impact on Occupants’ Experiences**

Vast sums of money spent to design, construct, operate and maintain museum additions require great accountability of design professionals towards museum visitors and employees. An urgent need exists for post-occupancy evaluations of high-profile museum additions in order to understand their successes and shortcomings, and how these designs affect the people who use them every day. The experience of art is framed not only by the object but also the space that contains it.

Our research takes a critical look at the effects of museum additions on occupants by addressing key issues: How does museum addition design affect how visitors and museum employees experience and perceive ‘front stage’ areas such as art galleries compared to ‘back stage’ areas such as employee work spaces? How does it affect the newly transformed museum building’s overall image, spatial layout, and aesthetics?

Our focus is on post-1970 building additions of four premier art museum institutions of the US: the Nelson-Atkins Museum of Art, the Phoenix Art Museum, the Met and the Art Institute of Chicago, employing a cross-section of methods: A computer-assisted space syntax analysis exercise combined with on-site physical observations, a qualitative content analysis of an in-depth literature review about both museums—before and after they were built, physical measurements of illuminance, and a survey of museum employees.

Results of our environment-behavior research are expected to have important implications for future museum addition designs, museum practice, and architectural practice.

**Research team biography:** The Principal Investigator, **Kathryn Anthony, Ph.D.** has over 30 years teaching and research experience in environmental behavior in design. She holds the lifetime title of ACSA Distinguished Professor in recognition of her career achievements in teaching, research, and service by the Association of Collegiate Schools of Architecture, the professional organization of architectural educators representing 250 schools of architecture in North America. She is currently the only female Full Professor in the School of Architecture, at the University of Illinois at Urbana-



Champaign (UIUC). She is the author of over 100 publications and three books, including the award-winning *Designing for Diversity: Gender, Race and Ethnicity in the Architectural Profession*.

Graduate Research Assistant, **Altaf Engineer** is a third year doctoral student in architecture with a dissertation focus on social and behavioral factors in museum design and a longstanding interest in museum additions. He is a LEED Accredited Professional with eight years of experience in the architectural profession and a strong background in sustainable design. He is a recipient of the prestigious Illinois Distinguished Fellowship Award for his current research and the Architectural Research Colleges Consortium (ARCC) King's Medal Award for his Master's thesis work on museums and daylighting.

**Susan Frankenberg, Ph.D.**, Graduate Program Coordinator of Museum Studies and Director of the Spurlock Museum at UIUC has made numerous book contributions and authored many journal articles on archaeology and anthropology. **Carla Santos, Ph.D.**, Graduate Program Coordinator of Cultural Studies in Tourism at UIUC serves on the board of directors of the Collaborative for Cultural Heritage Management and Policy and is a faculty associate of the European Union Center at UIUC. She serves on the editorial boards of several tourism and travel research journals. **Joy Malnar** is an architecture professor at UIUC whose work focuses on the sensory attributes of architecture. She conducts design studios and graduate seminars based on her book, *Sensory Design*. Her most recent book, *New Architecture on Indigenous Lands* examines buildings designed by Native American and First Nation architects addressing cultural and environmental sustainability.

## Appendix B: Online survey administered to museum employees

1. How long have you worked at this museum?  
(please round off of the nearest number of years)
2. What is your current job description?
3. Do you have your own office or do you share a work space?
4. Do you work within a single space or multiple spaces throughout the day?  
☐ Single work space  
☐ Multiple work spaces
5. Where is your current work space located (eg. front desk, art gallery, administration suite, educational facility, conservation lab, museum shop, café, etc.)? Did the location change after a museum addition was built (if you were employed at the same museum at that time)?
6. Does your work space have at least one opening to the outside? If yes, then please specify the type of opening/openings (window, skylight, door, etc.).

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If you answered 'No' to question #6, go directly to question #8

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7. What is the approximate sum total of the size of all openings (in square feet)? Your best estimate is fine!
8. Do you have the ability to control electrical light or daylight, or both in your workspace? Please make one or more selections:  
☐ Ability to control electrical light (via a switch, dimming controls, etc.)  
☐ Ability to control daylight (via window blinds, shades, etc.)  
☐ None of the above
9. Towards which direction does the opening/do the openings face? Please select all that apply:

1 North	2 South	3 East	4 West	5 Northeast	6 Northwest	7 Southeast	8 Southwest
○	○	○	○	○	○	○	○

10. Please rate your level of satisfaction with the items in the first column by making an appropriate selection below:

	1 Very dissatisfi ed	2 Dissatisfie d	3 Somewha t dissatisfi ed	4 Neither dissatisfied nor satisfied	5 Somewha t satisfied	6 Satisfied	7 Very satisfied	
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The amount of view of nature that your work space receives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not Applicable: I have no view <input type="radio"/>
The quality of the view to the outside from your work space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not Applicable: I have no view <input type="radio"/>
The amount of daylight that your work space receives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not Applicable: It does not receive any daylight <input type="radio"/>
The amount of light in your work space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Your overall work space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

11. Please rate your level of desirability with the items in the first column by making an appropriate selection below:

	1 Very Undesirable	2 Undesirable	3 Somewhat undesirable	4 Neither undesirable nor desirable	5 Somewhat desirable	6 Desirable	7 Very desirable
Daylight in the work space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daylight in art galleries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daylight in the museum lobby, atrium, shop, café or restaurant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Please rate your level of satisfaction with the items in the first column in your work space, for each of the following:

	1 Very	2 Dissatisfied	3 Somewhat	4 Neither	5 Somewhat	6 Satisfied	7 Very
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	Dissatisfied		dissatisfied	dissatisfied nor satisfied	satisfied		satisfied
Adequacy of Space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acoustics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Temperature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Odor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aesthetic Appeal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility for Persons with Disabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Please rate the items in the first column by making an appropriate choice below:

	1 Much worse	2 Worse	3 Somewhat worse	4 Neither worse nor better	5 Somewhat better	6 Better	7 Much better
Your personal work space in this museum compared to the public spaces that visitors see	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The work spaces of other employees in this museum compared to the public spaces that visitors see	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Which work spaces in the museum are the best and why?

15. Which work spaces, if any, are the worst and why?

16. Which public spaces in the museum are the best and why?

17. Which public spaces, if any, are the worst and why?

18. Please rate your level of satisfaction with the items in the first column by making an appropriate selection below:

	1 Very Positive	2 Positive	3 Somewhat positive	4 Neutral	5 Somewhat negative	6 Negative	7 Very negative
Your opinion of the museum addition(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fellow employees' opinions of the museum addition(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visitors' opinions of the museum addition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. If you had an opportunity to change one thing in the museum addition building, what would it be? Please state briefly in 2 or 3 sentences.

20. To the employees of the Nelson-Atkins Museum of Art:

4 different opinions by critics on Bloch Building addition of the Nelson-Atkins Museum of Art are stated below. On a scale of 1 to 7 where 1 is "Completely disagree" and 7 is "Completely agree", please rank each statement.

a. *"For the art world, the addition, known as the Bloch Building, should reaffirm that art and architecture can happily coexist."*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

b. *"With multiple levels woven around a constantly changing topography, the Bloch Building, as the new structure is called, is highly complex."*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

○	○	○	○	○	○	○
---	---	---	---	---	---	---

- c. *“throughout the Bloch Building he(Holl) treats light as if it were a building material in itself. Illumination from the clerestory windows, as well as from sections of translucent glass wall, diffuses gently through the galleries...producing an interior of cool, even light.”*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
○	○	○	○	○	○	○

- d. *“the lenses...lose some of their magical quality in bright sunlight, when the translucent glass has less depth and mystery and can seem like hard plastic”*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
○	○	○	○	○	○	○

**\*\*End of Survey. Thank you!\*\***

OR

**20. To the employees of the Phoenix Art Museum:**

4 different opinions by critics on 1996 and/or 2006 additions of the Phoenix Art Museum are stated below. On a scale of 1 to 7 where 1 is “Completely disagree” and 7 is “Completely agree”, please rank each statement.

- a. *“The expansion is characterized by innovative design and detailed craftsmanship.”*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
○	○	○	○	○	○	○

- b. *“It's as if the institutional art world has adapted the old swim-or-die superstition about sharks: keep building or become irrelevant.”*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
○	○	○	○	○	○	○

- c. *"Williams and Tsien have a very refined sense of incident. Their ability to produce such complex movement within a project of relatively modest scale is by use of a canny, elegant plan and by beautifully developed events en route -- landing sites and overlooks, changes in color and materiality, flashes of light through apertures ranging from windows to glazed form-tie holes."*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- d. *"At a time when schools are deteriorating, roads are crumbling, and low-income housing is woefully underfunded, one can't help but question the vast sums being spent on new museums...but the extravagance is certainly good for the art of architecture and for the few architects who get the chance to build museums."*

1 Completely disagree	2 Disagree	3 Somewhat disagree	4 Neither disagree nor agree	5 Somewhat agree	6 Agree	7 Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*\*End of Survey. Thank you!\*\***

## **Appendix C: Interview questions**

### Interview questions for the Director of Administration and Visitor Services/Visitor Services employee:

1. How long have you worked at the museum?
2. What are your responsibilities?
3. What is the average visitor attendance on a typical weekday and on a typical weekend at the museum?
4. What are the visitor demographics (age, gender, single/family)?
5. Did visitation increase or decrease after the museum addition(s)? By how much?
6. What are some of the reactions that the museum addition has evoked—from visitors and museum employees?
7. Have you heard of the phenomenon of museum fatigue? If yes, then how have you seen visitors and/or employees experiencing it?
8. What can one do to counter museum fatigue?
9. If there was one thing you could change in the museum design what would it be?

### Interview questions for an Exhibition Designer:

1. How long have you worked at the museum?
2. What are your responsibilities?
3. Has the addition changed anything for the exhibitions or individual works of art that you curate? If yes, then how?
4. What are some of the reactions that the museum addition has evoked—from visitors and museum employees?



5. Have you heard of the phenomenon of museum fatigue? If yes, then how have you seen visitors and/or employees experiencing it?
6. What can one do to counter museum fatigue?
7. If there was one thing you could change in the museum design what would it be?

Interview questions for a Curator:

1. How long have you worked at the museum?
2. What are your responsibilities?
3. Has the addition changed anything for the exhibitions or individual works of art that you curate? If yes, then how?
4. What are some of the reactions that the museum addition has evoked—from visitors and museum employees?
5. Have you heard of the phenomenon of museum fatigue? If yes, then how have you seen visitors and/or employees experiencing it?
6. What can one do to counter museum fatigue?
7. If there was one thing you could change in the museum design what would it be?

Interview questions for a Security Manager/Supervisor:

1. How long have you worked at the museum?
2. What are your responsibilities?
3. How long is your typical shift?
4. Has your experience of the museum changed after the new addition(s)? If yes, could you identify the specific factors contributing to this change?

5. Have you heard of the phenomenon of museum fatigue? If yes, then how have you seen visitors and/or employees experiencing it?
6. What can one do to counter museum fatigue?
7. If there was one thing you could change in the museum design what would it be?

Interview questions for a Docent:

1. How long have you worked at the museum?
2. What are your responsibilities?
3. How often do you volunteer in a typical week/month?
4. Has your experience of giving docent tours at the museum changed after the new addition(s)? If yes, could you identify the specific factors contributing to this change?
5. Have you heard of the phenomenon of museum fatigue? If yes, then how have you seen visitors and/or employees experiencing it?
6. What can one do to counter museum fatigue?
7. If there was one thing you could change in the museum design what would it be?

## Appendix D: Institutional review board (IRB) approval

### UNIVERSITY OF ILLINOIS AT URBANA - CHAMPAIGN

Office of the Vice Chancellor for Research  
Institutional Review Board  
528 East Green Street  
Suite 203  
Champaign, IL 61820



August 22, 2013

Kathryn Anthony  
Architecture  
117 Temple Buell Hall  
611 Lorado Taft Drive  
M/C 621

RE: *More Than Meets the Eye: The Design of "Starchitect" Museum Additions and Their Impact on Occupants' Experiences*  
IRB Protocol Number: 13886

Dear Dr. Anthony:

Thank you for submitting the completed IRB application form for your project entitled *More Than Meets the Eye: The Design of "Starchitect" Museum Additions and Their Impact on Occupants' Experiences*. Your project was assigned Institutional Review Board (IRB) Protocol Number 13886 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. **Exempt protocols are approved for a maximum of three years.** Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at <http://www.irb.illinois.edu>.

Sincerely,

A handwritten signature in black ink, appearing to read "BA", followed by a horizontal line.

Belinda Adamson, Human Subjects Research Coordinator, Institutional Review Board

c: Altaf Engineer

telephone (217) 333-2670 • fax (217) 333-0405 • email [IRB@illinois.edu](mailto:IRB@illinois.edu)

**Fig. D.1:** University of Illinois Institutional Review Board (IRB) approval. Image source: author.

## Appendix E: Content analysis database

Museum	Number of articles	Database	Reference
Nelson-Atkins Museum of Art, Kansas City, MO	13	LexisNexis	Bradbury, D. (2007, January 13). The building blocks of America's best architect A breathtakingly simple new museum extension puts Steven Holl in a class of his own, says Dominic Bradbury. <i>The Daily Telegraph</i> , ART-4.
Search terms: Nelson-Atkins Museum, Bloch Building Nelson-Atkins			Filler, M. (2008, June 1). The good, the bad, and the horribly misguided. <i>Architectural Record</i> , 196(6), 51.
			Goldberger, P. (2007, April 30). Steven Holl's new Nelson-Atkins building. <i>New Yorker- New Yorker magazine Incorporated</i> , 83(10), 86-87.
			Iovine, J.V. (1999, July 12). Kansas City museum picks architect for addition. <i>The New York Times</i> , E-3.
			Iovine, J.V. (2006, December 31). Steven Holl's dark year gets brighter. <i>The New York Times</i> , 2-32.
			Kamin, B. (2007, May 27). A bright idea for museum design emerges in Missouri. <i>Chicago Tribune</i> , p. 6.5. Retrieved from <a href="http://search.proquest.com/docview/420583879?accountid=14553">http://search.proquest.com/docview/420583879?accountid=14553</a>
			Kennicott, P. (2007, May 20). This bright idea is a glowing achievement. <i>The Washington Post</i> . Retrieved from <a href="http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T20479344701&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultsUrlKey=29_T20479344705&amp;cisb=22_T20479344704&amp;treeMax=true&amp;treeWidth=0&amp;csi=8075&amp;docNo=1">http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T20479344701&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultsUrlKey=29_T20479344705&amp;cisb=22_T20479344704&amp;treeMax=true&amp;treeWidth=0&amp;csi=8075&amp;docNo=1</a>
			McGuigan, C. (2007, June 11). Notes From Underground; As museum architects take a shine to less bling, there's no place to go but down. <i>Newsweek</i> , 6, 65.
			Ouroussoff, N. (2007, June 9). A translucent and radiant partner with the past. <i>The New York Times</i> . Retrieved from <a href="http://www.nytimes.com/2007/06/06/arts/design/06nls.html?pagewanted=all&amp;r=0">http://www.nytimes.com/2007/06/06/arts/design/06nls.html?pagewanted=all&amp;r=0</a>
			S.L. (1999, August). Holl to give Kansas City museum a strikingly modern partner. <i>Architectural Record</i> , 187(8), 53.
			Sloan, G. (2007, August 17). Lighting the way in Kansas City; Modest metropolis in the Midwest is undergoing a mighty renewal. <i>USA Today</i> , 1D.
			Stephens, S. (2007, July 1). Steven Holl Architects merges architecture, art, and landscape into a unified experience for the Bloch Building at the Nelson-Atkins Museum of Art in Kansas City. <i>Architectural Record</i> , 195(7), 92-101.
			Swanson, S. (2009, December 4). Museum building boom on full display; Kansas City among cities seeing major expansions under way. <i>Chicago Tribune</i> . Retrieved from <a href="http://search.proquest.com.proxy2.library.illinois.edu/chicagotribune/docview/419878501/5A4ABC464CCC45DDPQ/1?accountid=14553">http://search.proquest.com.proxy2.library.illinois.edu/chicagotribune/docview/419878501/5A4ABC464CCC45DDPQ/1?accountid=14553</a>
	12	EBSCO Host	Buried Treasure (2007, February). <i>Interior Design</i> , 78(2), 43.
			Chen, A. (2008). Steven Holl's Global Footprint. <i>Fast Company</i> , (129), 150-154.
			Conrads, M. C. (2010). Journey to the center of the object. <i>American Art</i> , 24(2), 21-23.
			Dobrzynski, J. H. (2007, June 7). It is what's inside that dazzles. <i>Wall Street Journal - Eastern Edition</i> . Retrieved from <a href="http://web.a.ebscohost.com.proxy2.library.illinois.edu/ehost/detail/detail?vid=2&amp;sid=c119e7d9-3ca3-495a-96ae-67857c3b7b27%40sessionmgr4003&amp;hid=4207&amp;bdata=jnNpdGU9ZWhvc3QtbnG12ZQ%3d%3d#db=bth&amp;AN=25401172">http://web.a.ebscohost.com.proxy2.library.illinois.edu/ehost/detail/detail?vid=2&amp;sid=c119e7d9-3ca3-495a-96ae-67857c3b7b27%40sessionmgr4003&amp;hid=4207&amp;bdata=jnNpdGU9ZWhvc3QtbnG12ZQ%3d%3d#db=bth&amp;AN=25401172</a>
			Gebhart, F. Space influx gives K.C. a shot in the arm. <i>Meeting News</i> , 27(8), 22.
			Greengard, S. (2008). In a Different Light. <i>PM Network</i> , 22(7), 54-59.
			Lacayo, R. (2007). Light at the Museum. <i>Time</i> , 169(24), 102-103.
			Richmond, H. (2007, January 9). Landscape & light. <i>Contract</i> , 49(9), 1-4.
			Slessor, C. (2007, October). The Stone and the Feather. <i>Architectural Review</i> , 222(1328), p40-41.
			Webb, M. (2007). Lighting up the midwest. <i>Architectural Review</i> , 222(1328), 42-51.
			Wong, J. F. (2012). The script of viscosity: the phenomenal experience in Steven Holl's museum architecture. <i>Journal Of Architecture</i> , 17(2), 273-292. doi:10.1080/13602365.2012.678646
			Youmans, J. M. (2000). African art at the Nelson-Atkins Museum of Art. <i>African Arts</i> , 33(4), 40.
	3	ProQuest	Newsdesk (2008, September 7). Steven Holl's 'glowing' expansion to the Nelson-Atkins Museum of Art opens in Kansas City, Mo. <i>Building Design &amp; Construction</i> , 48(2), 19.
			Paul, S. (2006, February 6). Museum's 'lenses' are slowly coming into focus: Through trial and error, Nelson-Atkins is cast in a whole new light. <i>Knight Ridder Tribune Business News</i> . Retrieved from <a href="http://search.proquest.com/docview/461439048?accountid=14553">http://search.proquest.com/docview/461439048?accountid=14553</a>
			Walker, S. (1999, August 6). Nelson expansion ends sculptor's unfinished art. <i>Kansas City Business Journal</i> , 17(48), 7.
<b>Total</b>	<b>28</b>		

Art Institute of Chicago, Chicago, IL	21	LexisNexis	Falconer, M. (2009, May 19). The windy city blows it; Chicago is famous for its stunning buildings, but the new Modern Wing of its Art Institute shows the dangers of 'star-chitecture', reports Morgan Falconer. <i>The Times (London)</i> . Retrieved from <a href="http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/api/version1/sr?icvprg=true&amp;c=00006&amp;hes=t&amp;hns=t&amp;hpr=t&amp;hfb=t&amp;hd=t&amp;hb=t&amp;hgn=t&amp;hns=t&amp;hdym=t&amp;ssl=f&amp;so=re&amp;sr=windy+city+blows+it+chicago+is+famous+its+stunning+buildings+but+new+modern+wing+its+art+institute+shows+dangers+%27star+chitecture%27+reports+morgan+falconer&amp;stp=fr&amp;hsl=t&amp;hs=t&amp;hv=t&amp;hh=t&amp;hcu=t&amp;hl=f&amp;hrg=t&amp;csi=237924&amp;secondRedirectIndicator=true">http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/api/version1/sr?icvprg=true&amp;c=00006&amp;hes=t&amp;hns=t&amp;hpr=t&amp;hfb=t&amp;hd=t&amp;hb=t&amp;hgn=t&amp;hns=t&amp;hdym=t&amp;ssl=f&amp;so=re&amp;sr=windy+city+blows+it+chicago+is+famous+its+stunning+buildings+but+new+modern+wing+its+art+institute+shows+dangers+%27star+chitecture%27+reports+morgan+falconer&amp;stp=fr&amp;hsl=t&amp;hs=t&amp;hv=t&amp;hh=t&amp;hcu=t&amp;hl=f&amp;hrg=t&amp;csi=237924&amp;secondRedirectIndicator=true</a>
			Ourousof, N. (2009). ... In a Building Embracing Chicago. <i>The New York Times</i> . Retrieved from <a href="http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T20479369896&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultUrlKey=29_T20479375300&amp;cisb=22_T20479369899&amp;treeMax=true&amp;treeWidth=0&amp;csi=6742&amp;docNo=10">http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T20479369896&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultUrlKey=29_T20479375300&amp;cisb=22_T20479369899&amp;treeMax=true&amp;treeWidth=0&amp;csi=6742&amp;docNo=10</a>
			French, Paul (2009, May 27). Raising the roof; Chicago already has some of North America's greatest buildings. But recent additions to the skyline - including Renzo Piano's grand wing at the Art Institute of Chicago - are giving architecture fans new reasons to visit reports. <i>The Globe and Mail</i> , R8.
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			Rosenbaum, L. (2009, June 2). A modern wing takes flight. <i>The Wall Street Journal</i> . Retrieved from <a href="http://online.wsj.com/article/SB124389457545274005.html">http://online.wsj.com/article/SB124389457545274005.html</a>
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			Minutillo, J. (2009, August 1). Renzo Piano Building Workshop bridges a historic structure and a grand public space with its trademark Classicism at The Art Institute of Chicago's Modern Wing. <i>Architectural Record</i> , 197(8), 53.
			(2009, December 1). The Art Institute of Chicago - Modern Wing restaurant. <i>Midwest Construction</i> , 12(12), 41.
			McKuen, P.D. (2008, January 1). Modern art wing; Expansion paints gritty canvas of chicao with parisian cachet. <i>Midwest Construction</i> . Retrieved from <a href="http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/api/version1/sr?icvprg=true&amp;c=00006&amp;hes=t&amp;hns=t&amp;hpr=t&amp;hfb=t&amp;hd=t&amp;hb=t&amp;hgn=t&amp;hns=t&amp;hdym=t&amp;ssl=f&amp;so=re&amp;sr=modern+art+wing+expansion+paints+gritty+canvas+chicago+parisian+cachet&amp;stp=fr&amp;hsl=t&amp;hs=t&amp;hv=t&amp;hh=t&amp;hcu=t&amp;hl=f&amp;hrg=t&amp;csi=237924&amp;secondRedirectIndicator=true">http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/api/version1/sr?icvprg=true&amp;c=00006&amp;hes=t&amp;hns=t&amp;hpr=t&amp;hfb=t&amp;hd=t&amp;hb=t&amp;hgn=t&amp;hns=t&amp;hdym=t&amp;ssl=f&amp;so=re&amp;sr=modern+art+wing+expansion+paints+gritty+canvas+chicago+parisian+cachet&amp;stp=fr&amp;hsl=t&amp;hs=t&amp;hv=t&amp;hh=t&amp;hcu=t&amp;hl=f&amp;hrg=t&amp;csi=237924&amp;secondRedirectIndicator=true</a>
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	4	EBSCO Host	More art in Chicago. (2009). <i>Building Design</i> , (1869), 6.
	8	ProQuest	Kamin, B. (2008, November 16). No tug of war here: Art Institute's curators and architects resolving differences over Modern Wing: Art Institute negotiates to resolve conflicts between art and vistas for new Modern Wing. Retrieved from <a href="http://search.proquest.com/docview/456767997?accountid=14553">http://search.proquest.com/docview/456767997?accountid=14553</a>
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			Gapp, P. (1988, September, 11). Winging it: Art Institute Addition is effective and tasteful...but the art galleries may need some rearranging. <i>Chicago Tribune</i> . Retrieved from <a href="http://search.proquest.com/docview/282577340?accountid=14553">http://search.proquest.com/docview/282577340?accountid=14553</a>
Total	33		

Metropolitan Museum of Art, New York, NY Search terms: Metropolitan Museum Addition, Metropolitan Museum Kevin Roche, American Wing Metropolitan Museum, Sackler Wing Metropolitan Museum, Lehmann Wing Metropolitan Museum, Wallace Wing Metropolitan Museum, Petrie Court Metropolitan Museum, Great Hall Metropolitan Museum, Greek and Roman Galleries Metropolitan Museum, Rockefeller Wing Metropolitan Museum, Temple of Dendur Metropolitan Museum	12	LexisNexis	Vogel C. (2009, May 5). The Met offers a new look at Americana. <i>The New York Times</i> , C-5.
			GAM (1981, March 28). Sweeping master plan to get more treasures on display. <i>The Globe and Mail (Canada)</i> . Retrieved from <a href="http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T21406130700&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultSUrlKey=29_T21406130704&amp;cisb=22_T21406130703&amp;treeMax=true&amp;treeWidth=0&amp;csi=303830&amp;docNo=1">http://www.lexisnexis.com.proxy2.library.illinois.edu/lnacui2api/results/docview/docview.do?docLinkInd=true&amp;risb=21_T21406130700&amp;format=GNBFI&amp;sort=RELEVANCE&amp;startDocNo=1&amp;resultSUrlKey=29_T21406130704&amp;cisb=22_T21406130703&amp;treeMax=true&amp;treeWidth=0&amp;csi=303830&amp;docNo=1</a>
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			Brenson, M. (1983, September 19). Newest wing at Met completes first phase. <i>The New York Times</i> , C-13.
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			McGill, D.C. (1986, March 28). Metropolitan Museum unveils \$26 million wing. <i>The New York Times</i> , C- 33.
			Stevens, M. (1978, October 2). Temple transplant. <i>Newsweek</i> , 86.
	7	EBSCO Host	Vogel C. (2012, July 17). Metropolitan Museum sets record for visitors. <i>The New York Times</i> . Retrieved from <a href="http://web.a.ebscohost.com.proxy2.library.illinois.edu/ehost/detail/detail?vid=1&amp;sid=af07c29b-d09b-4d6f-8d90-8a2a7974000c%40sessionmgr4001&amp;hid=4207&amp;bdata=JnNpdGU9ZWWhvc3QtYGl2ZQ%3d%3d#db=a9h&amp;AN=77748020">http://web.a.ebscohost.com.proxy2.library.illinois.edu/ehost/detail/detail?vid=1&amp;sid=af07c29b-d09b-4d6f-8d90-8a2a7974000c%40sessionmgr4001&amp;hid=4207&amp;bdata=JnNpdGU9ZWWhvc3QtYGl2ZQ%3d%3d#db=a9h&amp;AN=77748020</a>
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	9	ProQuest	Sozanski, E.J. (1987, February 8). Going modern the Metropolitan opens a handsome new wing. <i>ChicagoTribune</i> . Retrieved from <a href="http://articles.chicagotribune.com/1987-02-08/entertainment/8701110212_1_20th-century-art-sculpture-garden-new-wing/2">http://articles.chicagotribune.com/1987-02-08/entertainment/8701110212_1_20th-century-art-sculpture-garden-new-wing/2</a>
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			Hoelterhoff, E. (1987, March 17). The gallery: Vast new Wallace Wing opens at Met Museum. <i>Wall Street Journal</i> . Retrieved from <a href="http://search.proquest.com/docview/397988204?accountid=14553">http://search.proquest.com/docview/397988204?accountid=14553</a>
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			Dudar, H. (1987, May 1). New York's Metropolitan enters the 20th century with a bang. <i>Smithsonian</i> , 18, 46.
			Siegel, L. (1993, October 22). Too high the cornices: The Met's new galleries. <i>Commonweal</i> , 120(18), 21.
			(2007, June). Metropolitan Museum unveils new Greek and Roman Galleries. <i>Art Business News</i> , 34(6), 14.
Total	28		Broome, B. (2007, June). Seeing the light in the Met's newest galleries. <i>Architectural Record</i> , 195(6), 50.

Phoenix Art Museum, Phoenix, AZ Search terms: Phoenix Arts Museum, Phoenix Arts Museum addition	7	LexisNexis	Staff (2007, December 1). Phoenix Art Museum; Editor's Choice: Renovation/Restoration. <i>Southwest Contractor</i> , 68(12), 69.
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<b>Total</b>	<b>11</b>		

<b>Total, from all four museums</b>	<b>100</b>
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